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SCIENCES

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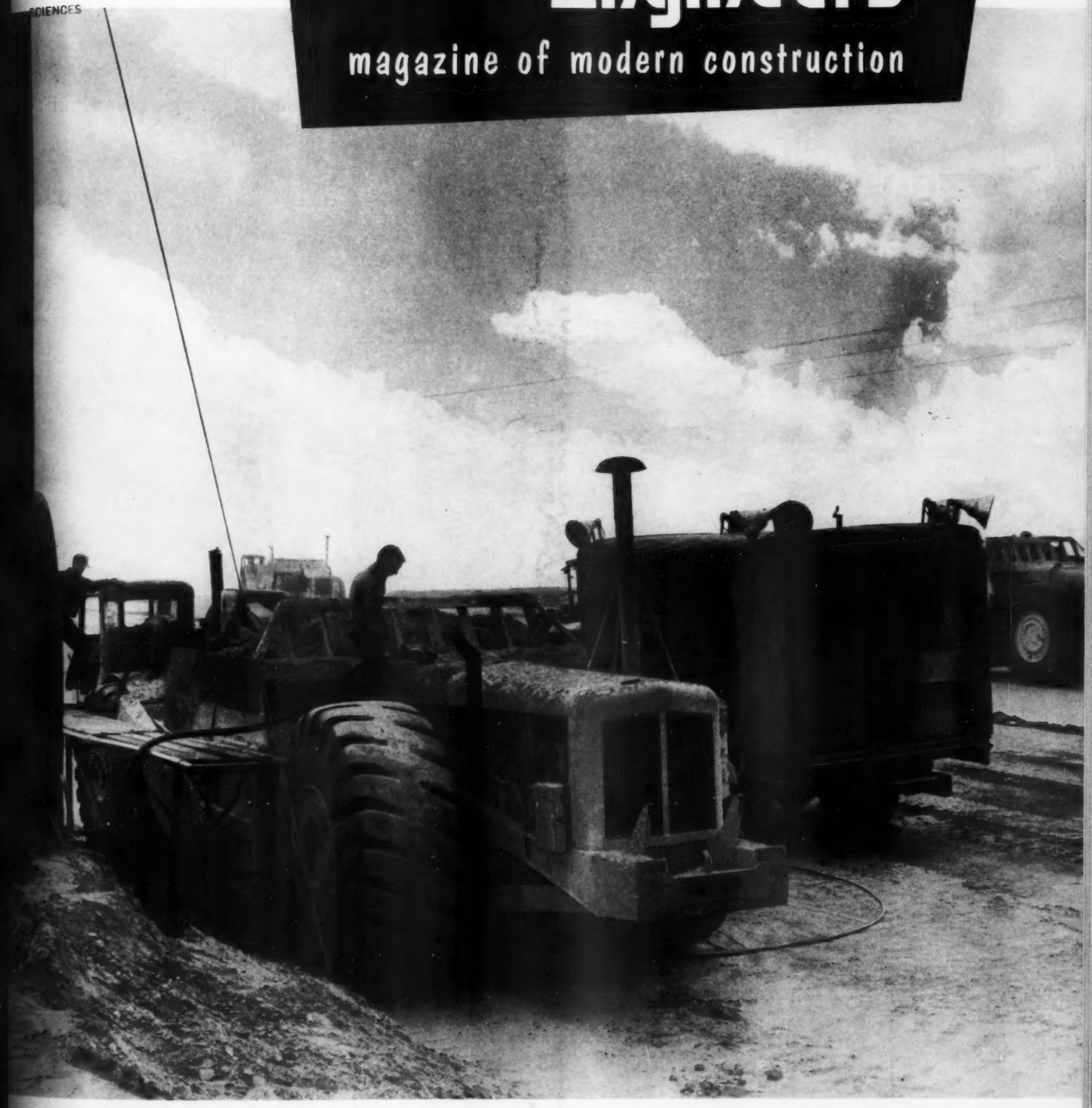
magazine of modern construction



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WINTER WORK

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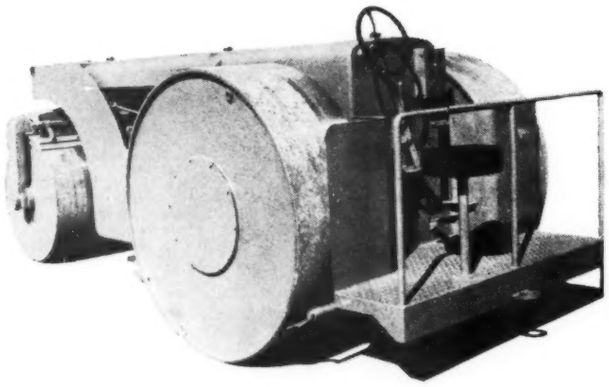

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magazine of modern construction

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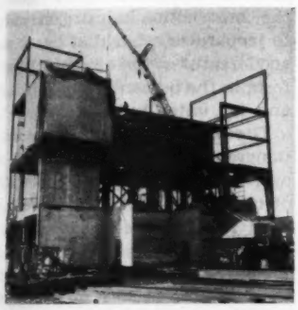

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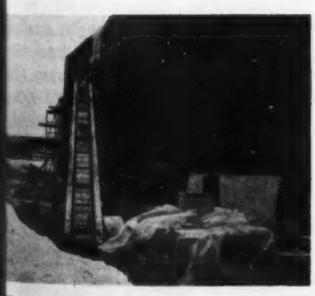

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Editorial

Better late than never

In its waning hours of legislation last month, the 86th Congress finally got together to enact into law the Fallon 1959 highway bill. Approval did not come any too soon. Road construction was beginning to lag in many states. Job lettings were delayed as state agencies waited to see how Congress would act. Contractors were concerned whether any highway work at all would be forthcoming. In New York State, for instance, the Department of Public Works stopped awarding highway contracts in August when the U. S. Bureau of Public Roads was unable to guarantee aid for future projects. Now it is up to all the states, particularly those in northern climes, to get projects started as soon as possible under the new highway financing bill. Greater than ever is the need of working through the winter to pick up the slack in road construction.

In its final form, the pay-as-you-build legislation was something of a compromise. The Administration's recommendation of a 1½-cent rise in the gasoline tax was cut to one cent, but fiscal soundness was maintained with the addition of some diverted revenues from automobile excise taxes. While interstate highway building will go ahead on a self-supporting basis, the program will be reduced in volume about 19 per cent from present spending. This cut will continue for two years, at the end of which time the Highway Trust Fund will receive increased diversion revenues from excise taxes on automobiles, parts, and accessories.

One of the unfavorable provisions of the highway financing bill is an amendment permitting states, if they so desire, to regulate billboards along interstate highways. This formerly came under the control of the federal government. States that avail themselves of this privilege, however, will have to pass up the bonus they would receive from the federal government based on mileage where billboards are banned. It is entirely conceivable, of course, that some states will favor billboards over the bonus.

Another major piece of legislation, the labor reform bill sponsored by representatives Landrum and Griffin, was badly needed. Even George Meany, president of the American Federation of Labor and Congress of Industrial Organizations, admitted that private polls showed any number of good trade unionists were convinced a new law was needed to curb the power of union heads. As far as the construction industry goes, however, the legalizing of prehire agreements and a 7-day waiting period for a union shop —except in states where right-to-work laws prevail—is far from a labor reform provision. Sen. John L. McClellan (D., Ark.) opposed this prehire provision as inviting dictatorship from the top and sweetheart contracts. He termed it unfortunate that such a concession had to be made in the conference committee, at the expense of the construction industry, in order not to jeopardize a bill that has so many good features for effective labor reform in the best interests of the rank-and-file union member.

The third most important act of Congress before adjournment was overriding President Eisenhower's veto of the public-works bill. The bill had been rejected because it included 67 river and harbor projects that the President felt were unnecessary, and that would cost $800 million to complete over an extended period of years. Sen. Allen J. Ellender (D., La.) termed the veto "absurd," pointing out that the President requested $835 million for this fiscal year alone for economic aid to underdeveloped military allies under the foreign-aid program. More than the necessary two-thirds of Congress went along with the senator from Louisiana.

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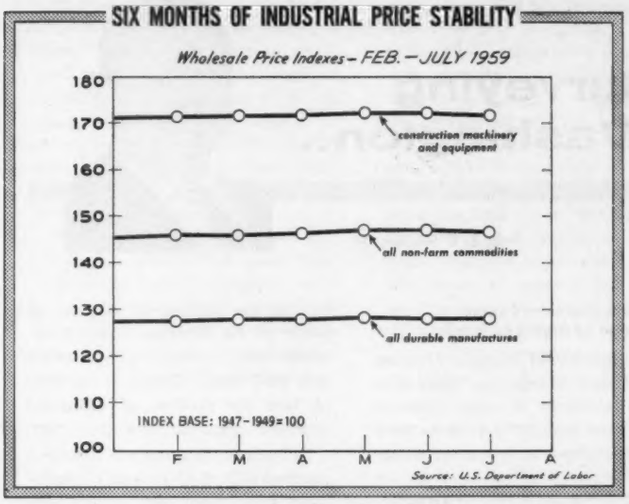
Business Comment

After the strike



In late September, with the longest industry-wide steel strike in history going into its tenth week, steel users heard some disquieting news. A nationwide survey revealed that most steel makers were already booked solid for at least four months of post-strike production.

Among items already in heavy demand were cold and hot-rolled steel, galvanized sheets, special and miscellaneous structural-steel shapes, heavy plate, and cold-rolled strip and bars.

With shortages spreading, this backlog was sure to grow at a faster rate each succeeding day of the strike.

Some steel users were beginning to wonder how they would fare in the scramble for new stock after the strike was ended. Would they be paying more for steel, no matter what the final terms of the settlement?

Late last month a settlement appeared as remote as when the strike began on July 15. Management seemed as determined as ever to hold the line on total labor costs through cost-saving changes in plant practices. Union leaders apparently were trying to convey to rank-and-file members the feeling that the security of the union itself was at stake.

Whatever the final effect of the strike on steel users, the steel industry's stand has strengthened the hand of management in other industries facing labor negotiations this year. It has called public attention to the fact that industry is finding it increasingly difficult, under 1959 economic conditions, to make up for added labor costs by passing them on to the consumer.

As new facilities built in the plant and equipment boom of 1955–1957 have come into full production, growing capacity has been working in favor of the consumer. The results of this can be seen in several industrial components of the wholesale-price index. These have been rising fastest in recent years, but in July of this year they were hovering close to their levels of last February.

For the first time since World War II, anti-inflationary forces are thought to be strong enough to offer hope that the now familiar wage-price spiral can be curtailed on an industry-by-industry basis.

The chances of doing this depend largely on the price of steel in coming months. But once the strike is ended steel will be at a premium, not only because of pent-up demand but also because of a renewed boom in capital goods that was developing when the strike began.

Contractor demand for trucks, earthmovers, and other construction machines is contributing to this boom. Total 1959 sales are far above last year's depressed level of $900 million. Industry officials believe that they are running 10 per cent higher than in 1956, the year a record volume of $1.9 billion worth of equipment was sold.

South Dakota can employ stage construction on highways . . . with ASPHALT

Second step in stage construction on U. S. Route 212 in South Dakota. Laying plant-mixed Texaco Asphaltic Concrete over old Road-mixed asphalt pavement.

Type of rollers used to assure satisfactory compaction of new Texaco Asphaltic Concrete wearing surface.

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Stage construction of highways with asphalt enables South Dakota to spread the cost over the years, while giving traffic a durable, all-weather pavement at all times.

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TEXACO

TEXACO ASPHALT

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Surveying Washington..

by E. E. Halmos, Jr.

Gas-tax rise won't solve shortage of highway funds

The federal-aid highway program will proceed without too much of a break, although it took Congress nearly nine months to quell its fears of voter resentment to approve a one-

cent gasoline tax rise to finance the program's work.

But construction men should take a serious look at the meaning of Congress' action in approving the Fallon bill (HR 8678).

1. The new program—a one-cent rise in gas taxes, plus some diversion of excise-tax receipts on automobiles and parts—is not a permanent solution to the problem of shortage of funds in the Highway Trust Fund, which must finance both interstate and ABC roads. Congress will have to face the problem of additional revenues again, no later than 1961.

2. The new revenues will finance a program of fund allocations for interstate work about $900 million less than was directed by previous legislation: $1.8 billion, as against $2.5 billion, for fiscal year 1961; and $2 billion, as against $2.2 billion, for fiscal 1962.

3. Because bills incurred by the speed-up ordered in 1958 (when an extra $1 billion was ordered spent to help out against a recession) are now coming due, the Bureau of Public Roads will have to use what it calls "contract control"—careful spacing of contract lettings—on the states so that it can pay new commitments when they are due.

The net result will be a reduction of some proportions in the amount of money that the states will have available for highway work over the next two years.

In 1961, the BPR is due to submit a whole set of new cost figures, traffic surveys, and suggested user-charges on which Congress will have to act to make further adjustments in the financing of the program.

Construction labor finds reform law acceptable

Construction got just about what it wanted in special considerations from the Landrum-Griffin labor reform law. Although the official line of the AFL-CIO was flat disapproval of the legislation, it is fairly obvious that construction labor wasn't terribly unhappy with the new law either.

Key points are these: secondary boycotts are prohibited; prehire agreements are legalized; and hot-cargo agreements are permitted on the construction site.

On secondary boycotts, contained in Section 704 of the new law, the basic provision outlaws strikes seeking to force individual workers to refuse to handle materials or products, strikes aimed at forcing an employer to join an organization, forcing employers to cease using any product, forcing employers to recognize any union if another has been certified, or forcing the employer to make work assignments to one group over another.

But the hot-cargo provision for construction, specifically exempting the industry from prohibitions imposed on other industries, may cause the lawyers trouble. All industry states the law, are "prohibited from entering any contract whereby the employer ceases or refrains from handling, selling, transporting, or otherwise dealing" in any product of another employer.

But construction is exempt, so long as the hot-cargo clause applies only to work done on the construction site.

That gives legality to many "voluntary" agreements already in force in the industry.

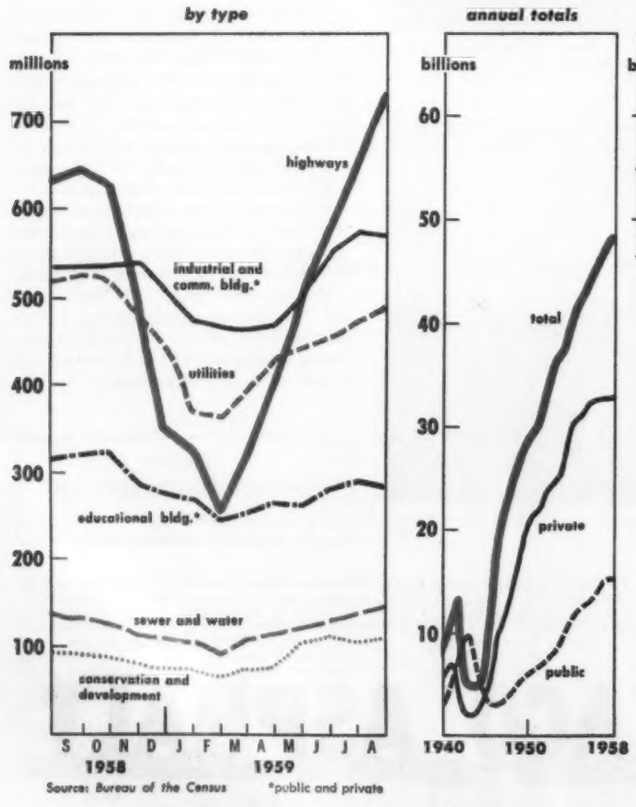
Prehire agreements are legal, even though they are made before a bargaining election is held. They may provide that workers hired must join a union within seven days of their employment; and for union referral of applications for jobs.

Other aspects troubling construction are these: the new law attempts to end "no-man's-land" squabbles by giving state courts and agencies the right to assert jurisdiction where the NLRB does not; it requires reporting of union financial affairs; reports of financial transactions of union officers and members; bonding of union

Industry Trends

DOLLAR VALUE OF NEW CONSTRUCTION

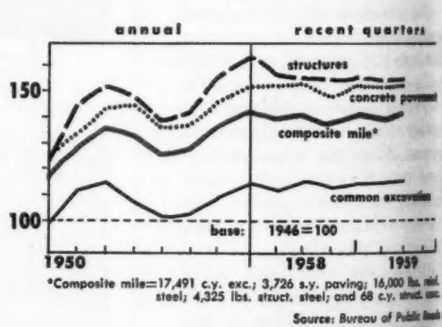
Recent Monthly Trends



Source: Bureau of the Census *public and private

AVERAGE BID PRICES

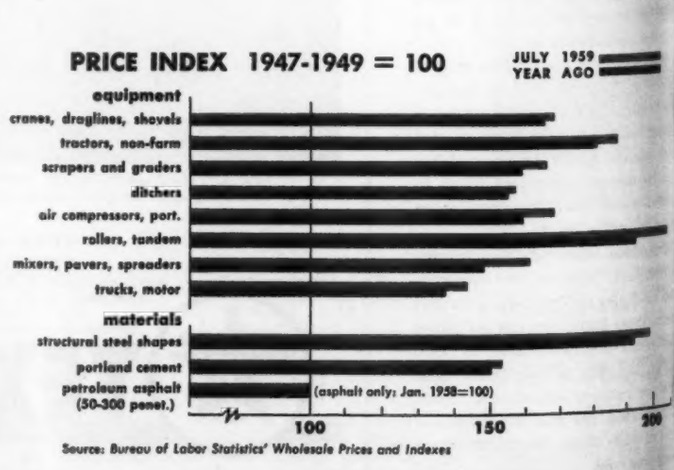
Federal Aid Highway Construction



*Composite mile=17,491 c.y. exc.; 3,726 s.y. paving; 16,000 lbs. reinf. steel; 4,325 lbs. struct. steel; and 68 c.y. struct. conc.

Source: Bureau of Public Roads

PRICE INDEX 1947-1949 = 100



Source: Bureau of Labor Statistics' Wholesale Prices and Indexes

officials up to $500,000; and it requires that employers, too, must report on funds paid out to union officers, excepting as employers, and to labor consultants.

Look for Congressional drive for civilian bomb shelters

Next session, look for a concerted drive in Congress to get a federal-aid program under way to construct bomb shelters for civilians. The basis for the drive will be a special report on dangers of atomic warfare, put out in August by a joint House-Senate committee. It sparked a number of comments on the Congressional floors that "do-it-yourself" programs of shelter building will not work.

Commission studying laws on taxing out-of-state firms

All the Congressional furor about stopping state taxation on out-of-state corporations finally boiled down to a rather innocuous law setting up a study commission, and to some minor clarifications of present legislation.

But this much you can count on: if the only business you do in another state is to solicit business, you won't be taxed by the other state. However, if you build something within a state outside your home state, you'll have to pay that outside state's taxes on your operations.

Actually, the excitement was caused not by construction men but by manufacturers, who feared that items manufactured in their home state and shipped to fill orders in another state could be taxed.

Public Works bill passed over Presidential veto

Congress overrode the President's veto of the $1.2 billion public-works bill.

The Presidential veto brought about some bitter comment from Congress. Much of it was partisan, but two points were significant.

First, immediately after the veto, Congressmen charged that the Bureau of the Budget—not Congress—would be the real author of whatever appropriation bill would get through.

Second, there were real threats that Congressmen who voted to uphold the initial veto would "have a tough job getting any projects next year."

HEW decries shortage of school, sewage-disposal facilities

There is a big future for construction in school work. The Department of Health, Education and Welfare declares that the nation was short about 130,000 classrooms as schools opened this fall.

HEW based its figures on an estimate that one in four residents of the U. S. are now attending school at some level, and the shortage keeps recurring as the population keeps going up. Last year, said HEW Secretary Flemming, the shortage was 140,500, so that the reduction has been only about 10,500 rooms, despite construction efforts to meet the need.

"At that rate," stated Flemming, "it would take 13 years to eliminate the accumulated shortage. We can't

For more facts, circle No. 253→

afford to wait that long." And he added that just reducing the shortage isn't enough; some 16,800 new classrooms are needed to replace facilities that have become obsolete just in the past year.

Flexing its enforcement muscles for a second time, HEW has ordered a second Missouri River city to get to work at once to build sewage-disposal facilities. Some 18 industries in St. Joseph, Mo., were also ordered to build treatment facilities. (Sioux City, Iowa, and 10 plants there were previously ordered to build treatment works.)

Under authority of a 1956 law, HEW can order such action after hearings and study. Flemming, at a news conference, showed himself to be especially annoyed at St. Joseph officials, who, he said, had made no attempt to remedy the pollution situation after voters turned down a bond issue more than a year ago.

But HEW's campaign is getting results. Construction expenditures like these have followed the evidence that the department will not hesitate to use its powers: sewage-treatment plants have been completed or are under way in six Nebraska cities along the Blue River; Bellevue, Nebraska City, and Omaha are getting major programs under way; Kansas City, Kans., is spending $3.7 million for interceptors and sites for treatment plants; and Kansas City, Mo., has completed preliminary engineering studies for treatment works.

Special report to Caterpillar D8 Tractor owners:

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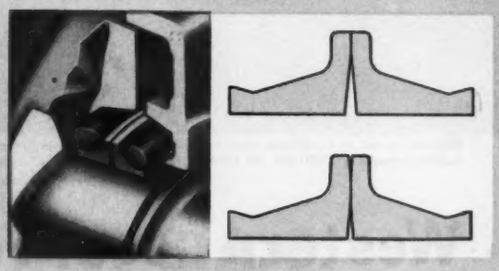
NOW—YOU CAN EQUIP YOUR D8 WITH LIFETIME LUBRICATED ROLLERS

AVAILABLE FOR 2U, 13A, 14A AND 15A MODELS

Forget about lubrication . . . and seal replacement. They're eliminated by this new concept in roller design and performance. The new lifetime lubricated rollers are lubricated when installed on your tractor. They'll never need lubrication until the rollers are disassembled for rim and flange rebuilding. The seals do not leak even after thousands of hours of operation. Seals won't need replacement when rollers are rebuilt. Another advantage—*oil* lubricant rather than grease is used because oil dissipates heat faster. Rollers operate at cooler temperatures. Bearings last longer.

New floating ring seal . . . wear does not decrease efficiency. The roller seal employs two metal alloy and two rubber "O" rings. The metal rings, much harder than file steel, have



lapped faces . . . smoother than glass. These faces taper slightly toward the inner edge forming a sealing area at the outer edge. As wear occurs, the sealing area moves inward, maintaining a perfect seal through thousands of hours.

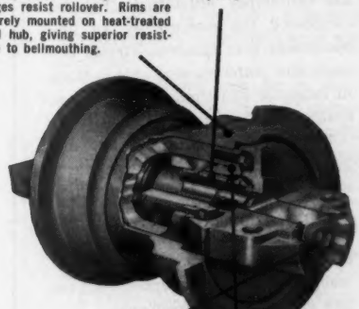
The "O" rings keep constant pressure on the metal rings. Lubricant can't get out. Grit can't get in. There are no springs or diaphragms to weaken, wear or become damaged. "O" rings are made of special compound to resist oil, heat and cold.

Millions of hours of proof—the toughest track roller yet. Cat lifetime lubricated rollers have been subjected to extensive and exhaustive on-the-job tests *for over 5 years*. Working under all types of job conditions, these time-tested rollers have proven unequalled. Their success is further amplified by new machine owner reports—for low-cost performance and minimum maintenance, Cat lifetime lubricated rollers can't be beat.

MANY OTHER NEW FEATURES THAT EXTEND TRACK ROLLER LIFE

RIMS — made from forged steel. Deep-hardened for long life. Wide flanges resist rollover. Rims are securely mounted on heat-treated steel hub, giving superior resistance to bellmouthing.

BEARINGS have high load carrying capacity.



LARGE DIAMETER SHAFT is double heat treated, making it extra stiff and resistant to wear.

BUSHINGS contain large oil reservoirs for more lubricant and better cooling.

Easy installation is achieved by use of snap rings to hold the seals and end collars in position before mounting. End collar bolt holes will line up easily with track roller frame holes during installation.

Stop track roller greasing now with these lifetime lubricated rollers. See your Caterpillar Dealer. He will give you the complete story on this time-saving, money-saving undercarriage component.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR

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SERVICE TIP: When rebuild time finally comes, be sure to keep the metal rings matched in original pairs, being careful not to nick or mar the lapped faces.

Labor Review

Labor reform bill approved by House; climaxes 2-year probe

The House quickly approved the compromise version of the Landrum-Griffin labor reform bill, September 4, and sent the measure to the White House for President Eisenhower's signature. The measure brought to the House by its conferees was approved by a vote of 352 to 52.

The President's signature on the bill will make the first major change in the Taft Act since 1947. And it will place on the statute books the first federal law regulating the internal affairs of labor unions as to the honesty and regularity of union elections, use of the trusteeship device to control subordinate bodies, detailed reporting and disclosure of union financial affairs, and protection of rights for individual union members.

The House action came less than 24 hours after the Senate had ratified the conference agreement on the differences between Senate and House labor bills.

The legislative action climaxes two years of Congressional investigations of racketeering and of the use by unions of boycotts and picket lines against business.

Congressional supporters of the House-approved Landrum-Griffin bill describe the compromise as basically the House measure, but Senator Kennedy (D., Mass.) says it is better than the Landrum-Griffin bill and better than no bill at all. Kennedy said, after the conference adjourned, that he considered the compromise an improvement over Landrum-Griffin because the conferees were able to work in language to permit legitimate activities to be continued.

The building trades win two important concessions in the compromise bill. In a last-minute switch, conferees restored the Senate's provision for prehire agreements in the construction industry, and subcontractor clauses are exempted from the ban on hot-cargo agreements.

Canadian ironworkers end 7-week strike, accept 57-cent package

A 7-week strike, which tied up an estimated $90 million worth of construction work in British Columbia, ended with an agreement between Iron Workers Local 97 and the Steel Erectors Association on a 57-cent, 27-month package.

Under the new contract, wage rates will go from the old rate of $2.62 an hour to $3.12 in three installments. A 32-cent increase is retroactive to January 1 of this year, 6 cents more takes effect as union members return to work, and 12 cents comes due April 1, 1960. The remaining 7 cents comes in the form of a health and welfare fund contribution, which employers will begin paying January 1, 1960.

The settlement is said to be one of the largest ever negotiated in British Columbia by a labor union.

Welfare Plan Workshop to be held in Los Angeles October 5 through 7

The Annual Workshop of the National Conference of Health and Welfare Plans, Trustees and Administrators—a 3-day series of discussions on health-welfare and pension-program management—will be held in Los Angeles, October 5 through 7, according to an announcement by M. A. Cornell, Jr., conference chairman. The meetings are open to both union and management representatives.

Workshop sessions will be held on the following subjects: Control of Medical and Hospital Costs, Investments and Reserves for Health and Welfare Plans, Self-Insurance, Overaged and Retired, Self-Contributions and Self-Employed, and Delinquent Employers.

Also scheduled is a Pension Forum, which will deal with the following: Basic Data Essential to Planning, Variable Annuities, and Investment Concepts.

Pipe fitters, carpenters last to settle in Cincinnati bargaining

A 2-year agreement between Cincinnati pipe fitters and the Mechanical Contractors Association put an end to an 11-week strike by Local 392 of the United Association, in which hiring was the chief issue.

Settlement came when the [illegible] accepted the association's proposal [illegible] an exclusive, nondiscriminatory [illegible] ing scheme that meets the National Labor Relations Board's [illegible] Pacific standards in every way, [illegible] cording to an employer spokesman.

The pipe fitters' 2-year pact also calls for hourly wage increases of [illegible] cents this year and 15 cents next year, retroactive to June 1.

A final settlement affecting [illegible] 3,200 carpenters brings to a close [illegible] year's building-trades bargaining [illegible] the Cincinnati area. In a 2-year agreement, carpenters got 15 cents [illegible] of August 17, and again June 1, 1960. In a change affecting travel pay, carpenters are to begin receiving an additional 2½ cents hourly as of January 1, 1960; this will replace and elim-

Western moved and replaced over 4 million yards of earth in building special $13,000,000 Jet runways for S.A.C. at Wright-Patterson A.F.B. Western is pushing for November 1959 completion of runway, ramp and taxi areas. They're using Texaco [illegible]

Western uses Texaco Lube Pla[illegible] pa

Problem: build a runway two miles long, two feet thick, and tough enough to take the landing shock of planes as heavy as a locomotive—a priority project that must be finished early in 1960. Western Contracting Corporation, Sioux City, Iowa, is moving ahead on this one right now, at the new $22-million Strategic Air Command Wright-Patterson Air Force Base near Dayton, Ohio. And to help make sure they finish on schedule, Western relies on a Texa[illegible] Simplified Lubrication Plan.

Here's how it works. The Texaco P[illegible] cuts total lube inventory down to six pro[illegible] ucts. That way, each of Western's lube [illegible] is a complete service station on wh[illegible] able to lubricate every piece of equipme[illegible] wherever it is.

The low inventory Texaco Plan c[illegible] chances for misapplication, too. It s[illegible]

ate all travel expense payments as of that date. Carpenters now earn $3.72½ an hour.

Southern Illinois laborers hold out for referral system; money "not an issue"

The status of the strike of southern Illinois laborers appeared differently when viewed through labor and management eyes.

Contractors, banded into the Southern Illinois Builders Association and the Southern Illinois Contractors Association, reported the status unchanged. Both Laborers' Local 100 in East St. Louis and Local 397 in Granite City, employed by building contractors, want a referral system that would require contractors to use the union as the source of manpower and "not solicit applications directly" nor "in any manner circumvent the union in the recruitment of applicants for employment." Money is not an issue, an association official says, since the unions have agreed to let the wage scale remain at $3.15 an hour through July 31, 1960.

The Laborers' District Council and Southern Illinois Contractors Association also could not get together on hiring, the association says. On the table was a union bid for 15 cents more an hour. Present rate is $3 in nonindustrial areas and $3.15 in industrial areas.

While negotiations were continuing, no settlement had been reached, stated a management spokesman, and association lines were holding a firm position.

A union official disagreed. The spokesman said 110 contractors have gone along with the union's hiring proposal, including half of the members of SIBA. Highway laborers in five of the 12 struck southern Illinois counties also are reported back on the job. Only a "few minor jobs" were still shut down, the union spokesman claimed.

Weekly report form provided by government for construction contractors

The Superintendent of Documents, Government Printing Office, Washington 25, D. C., now has payroll data reporting forms that construction contractors and subcontractors may use in their weekly reports to the government in connection with federal contracts, according to the Office of the Solicitor, Department of Labor.

The optional form was worked up by the office in cooperation with the Bureau of the Budget and the Department of Defense, it is reported, at the request of contractors.

The instructions on the back of the page one form explain that use of it is not mandatory but is to simplify reporting, adding:

"Properly filled out, this form will satisfy the requirements of Regulations, Parts 3 and 5 (29 CFR, Subtitle A), as to payrolls submitted in connection with contracts subject to the Davis-Bacon and related Acts."

The Form Sol. 184 costs $2.25 per 100 sheets. Continuation sheets are available at $2 per $100.

California ironworkers take 70-cent package over next three years

Negotiators for California ironworkers locals and Associated General Contractors chapters agreed on wage and fringe increases to total 70 cents over the next three years and rewrote their hiring provision to conform to NLRB's Mountain Pacific standards.

Hourly wage rates were increased 22½ cents, effective August 16, and will go up 20 cents in 1960 and 22½ cents in 1961. Health-welfare payments are increased 2½ cents this year to 12½ cents hourly and will go to 15 cents next year. Other economic changes include an increase in the foremen's differential from 30 cents to 35 cents; an increase in subsistence payments from $6.50 to $7 daily where applicable; and an increase in mileage allowance, where applicable, from 7 cents to 9 cents. A 10-cent hourly pension contribution is unchanged.

The new hiring provision is based on the ironworkers' "model" clause, but is said to contain "considerable changes," including one to do away with unilateral control of journeymen's examinations required of job applicants, and another to set up hearing procedures for unsuccessful applicants.

Current hourly wage rates under the agreement are $3.82½ for reinforcing; $4.07½ for structural; $4.07½ for ornamental; and $3.87½ for fence erectors.

Columbus, Ohio, bargaining completed for this year as operating engineers settle

On July 23, Columbus, Ohio, operating engineers got a 10-cent hourly raise with another 10 cents due May 1, 1960, in a 2-year agreement. In addition, a 10-cent welfare contribution is to become effective November 1, this year. New rates are $3.70 for crane and shovel operators, $3.47½ for bulldozer operators, and $2.67½ for oilers.

Columbus operating engineers stayed on the job during a nearly state-wide strike of the union against Ohio Road Builders on the basis of a verbal extension of their old contract past the May 1 expiration date, according to a statement by an employer spokesman.

Western's Texaco Plan enables mobile rig to handle all major lubrication in the field—eliminates wasteful deadheading.

e Plan pave the way for S.A.C.

...nhours in storage and handling. It cuts paper ...rk in ordering. And every lubricant in West-...'s Texaco Plan was chosen to meet the specific ...quirements of the job.

Cut costs on *your* next job. Get all the facts ...the Texaco Simplified Lubrication Plan from ...r Texaco Lubrication Engineer, or write:

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Throughout the United States

Canada • Latin America • West Africa

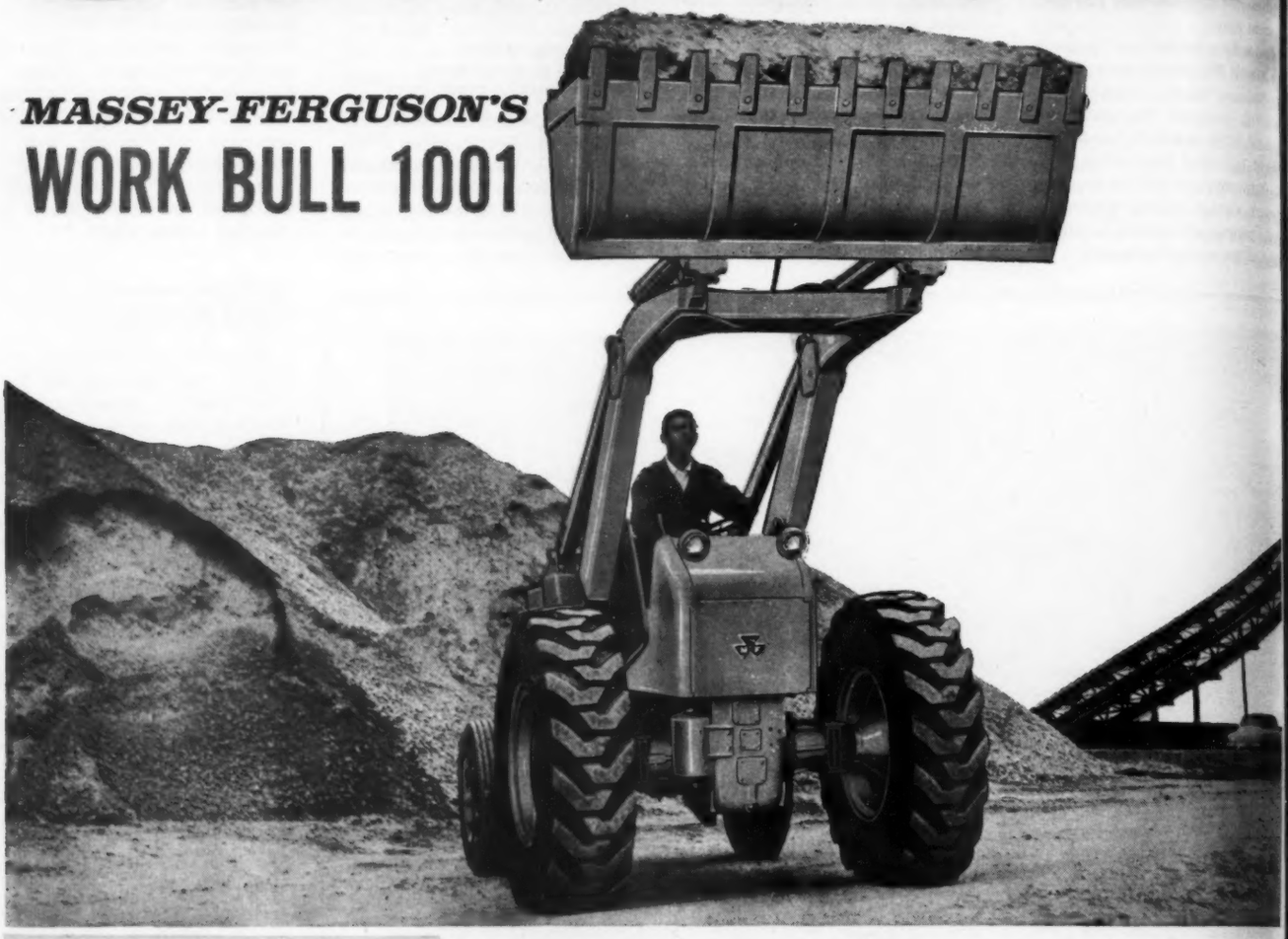
LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)

For more facts, use Request Card at page 18 and circle No. 254

COMPARE-

MASSEY-FERGUSON'S WORK BULL 1001



against any Tractor Shovel in its class!

☆ **EXCLUSIVE INSTANT REVERSING**—Change direction of travel — either forward or reverse— at a touch of your toe — no shifting . . . no clutching . . . no levers to pull. Shortens cycle time between load and dump.

☆ **PERFORMANCE**——One cubic yard SAE rated capacity, 43° rollback at ground level, direct-line thrust, torque converter, power steering, maximum visibility, five equal speeds forward and reverse add up to greater on-the-job performance.

☆ **VERSATILITY**—A full range of perfectly matched attachments include a combination Davis Backhoe-backfill blade, asphalt spreader, pick-up street sweeper, rotary boom, angle dozer, crane, fork lift, scarifier, and a variety of buckets.

☆ **QUALITY**—Designed and manufactured for rugged construction and industrial applications. Has strength built-in and quality in every part.

Yes, we invite you to compare Massey-Ferguson's Work Bull 1001 against all the rest. You'll soon be convinced of its superiority . . . of its profit-making and time-saving advantages on the job. You'll see why it can outperform costly, single-purpose machines. Ask your Massey-Ferguson Industrial Dealer for a demonstration.

Why Wait? Set a Date — We'll Demonstrate!

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For more facts, use Request Card at page 18 and circle No. 255

Heavy work required for odd-shaped plant

Workmen with Muller power trowels finish the 5 and 8-inch floor slabs of the new plant being built in Brunswick, Ga., for Bestwall Gypsum Co. The fresh surfaces are later covered with plastic curing sheets.

Extensive site grading, a concrete dock, pile foundations, and structural steelwork were among the requirements for the new gypsum products plant being built for the Bestwall Gypsum Co. at Brunswick, Ga. The project, being handled by Seaboard Construction Co., Brunswick, is scheduled for completion by the end of the year.

Pile foundations

The odd-shaped plant is 1,260 feet long and is supported on 10-inch-diameter concrete-filled pipe piles driven to a 40-ton bearing. This 900-foot dryer building is 40 feet wide and consists of four rows of piles spaced on 18-foot, 10-foot-2-inch, and 11-foot-10-inch centers. In this section of the plant, the concrete pile caps are connected by concrete beams that, in turn, support the 8-inch interior and 10-inch exterior spandrel walls.

The columns in the dryer building rest are on 20-foot centers, except for the length separating the dryer building and the main building. Here, the columns are spaced on 40-foot centers. They required 3 piles per column cap to support the heavier structural sections. Two rows of pile-supported columns, spaced on 40-foot centers, support this section of the plant.

The 200-foot-wide mill plant, connected to the main building, gives the L-shaped plant a total width of 320 feet. Within the junction of the dryer and main building, huge concrete footings, which required from 7 to 10 piles each, were poured to support the

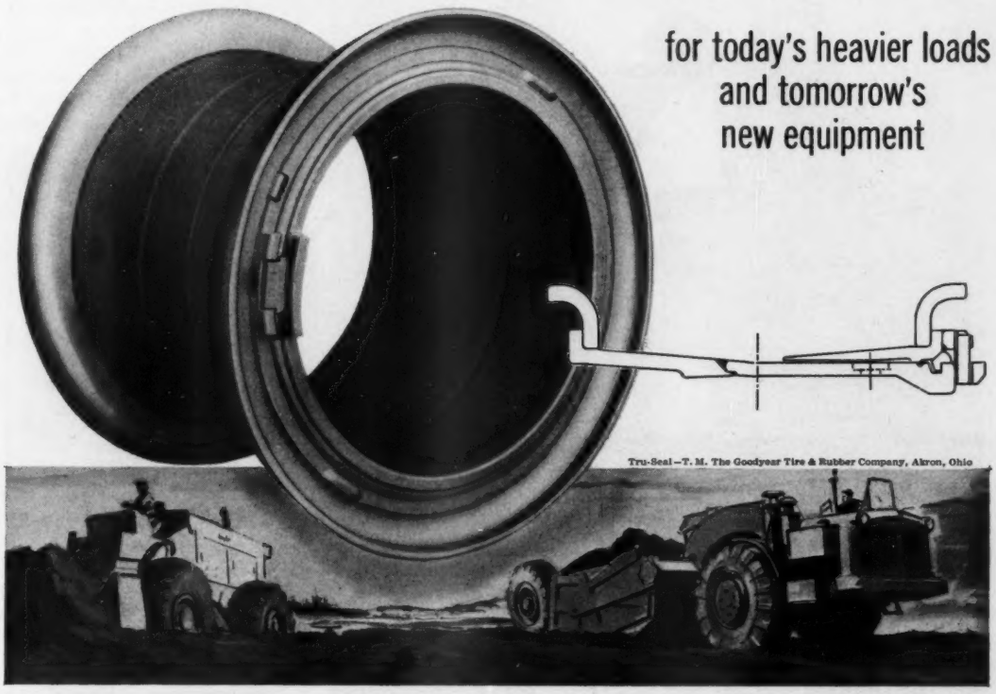
(*Continued on next page*)

A barge-mounted Manitowoc crane works on one of the facilities at the plant—a 500-foot concrete dock that will handle shipments of raw material. The 18-inch prestressed-concrete piles are driven by a Vulcan O hammer.

Introducing

The New Earth-Mover Rim

for today's heavier loads and tomorrow's new equipment



To meet the increased tonnages and the higher speeds of today's and tomorrow's earth-moving equipment, Goodyear presents a whole new line of heavier, stronger rims.

The new Earth-Mover Rim offers these standout advantages in every size from the smallest to the largest:

Extra thickness and weight to withstand greater horsepower, greater tire pressure and heavier loads. Down time reduced to a minimum.

Heavy-duty bead seat band driver—to prevent slipping.

Sealing ring – Goodyear's famous Tru-Seal principle provides positive air seal.

The Goodyear Earth-Mover Rim is now available in 29-inch and 33-inch diameters. These fine job-fitted rims are your best insurance against premature tire and rim failure.

Next time you need rims, why not benefit by Goodyear's incomparable experience in building rims of every kind and size for all types of vehicles. See your local distributor, or write:

Goodyear, Metal Products Division, Akron 16, Ohio.

Your tires go farther on RIMS by

GOODYEAR

MORE TONS ARE CARRIED ON GOODYEAR RIMS THAN ON ANY OTHER KIND

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Concrete-capped piles support the 900-foot-long dryer building. The outside row, right, supports spandrel wall and columns; capped piles, left, support only columns. The two interior rows, interconnected by cross beams, will support conveyor equipment.

At one end of the main building, huge concrete footings were required to support internal storage bins, some of which can be seen in the background. These footings required 7 to 10 piles apiece to support the heavy loads.

(Continued from preceding page)

large steel internal storage bins. These are erected inside the framework of the board plant area.

Over 3,000 tons of structural steel and 5-foot-deep roof trusses was shipped to Brunswick by rail, and erected with high-strength bolts. The roof trusses were fabricated with a slight taper to provide the proper surface drainage.

Ready-mix concrete was used to form the 8-inch and 5-inch floor slabs of the plant. The concrete was placed directly over the compacted backfill material. Muller power trowels were used to finish the concrete slab surfaces, which were cured by being covered with plastic sheets.

Seaboard Construction also constructed a 500-foot-long concrete dock to receive shipments of raw material. The dock is connected to the wharf by a causeway. Prestressed-concrete piles, 18×18 inches, were driven to minus 52 feet by a Vulcan O hammer handled by a barge-mounted Manitowoc crane. Jetting was necessary to permit the driving of the 60-foot-long pile sections.

Personnel

Anthony Aiello is the project manager for Johnson & Johnson, Inc., Chicago, Ill., the consulting engineers that designed the plant and are supervising the construction. THE END

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Count on Firestones to reduce your hourly costs—no matter where you work 'em! Every Firestone is job-engineered to match the punishment of the toughest jobs. They're built with Firestone Rubber-X, the longest-wearing rubber ever used in Firestone tires! Exclusive Firestone S/F (Shock-Fortified) nylon or rayon bodies shrug off bruising shock and impact. Specially designed Firestone treads and sidewalls roll through conditions that often ruin ordinary tires. Call your Firestone Dealer or Store and ask about the full line of Firestone tubeless or tubed off-the-highway tires. He'll recommend the tires that are built for your job! And, remember, Firestone off-the-highway tires are backed with on-the-job service!

Rock Grip Excavator Wide Base — Rock Grip Excavator

When ordering new equipment always specify Firestone tires—available tubeless or tubed.

Firestone

BETTER RUBBER FROM START TO FINISH

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Koehring acquires firm

■ The complete business of the Shawnee Mfg. Co., Inc., Topeka, Kans., has been acquired by Koehring Co., Milwaukee. The acquired company will operate as part of Koehring's Parsons Division, Newton, Iowa.

Shawnee manufactures backhoes, loaders, brooms, scrapers, and other attachments for wheel-type utility tractors.

Ramset opens new office

■ Warehouse and office facilities for Ramset Fastening System have been established in East Alton, Ill. The move was made to speed up service to dealers handling Ramset and Shure-Set fastening tools in the midwest sales area. The company is part of Olin Mathieson Chemical Corp., New York City.

Gar Wood division news

■ Milton Bogrow has been named credit manager of Gar Wood Industries, Wayne Division, Wayne, Mich. He was formerly assistant to Donald Connor, who resigned to become a member of Gar Wood-Detroit Truck Equipment, Inc., a new Gar Wood truck-equipment distributor in the Detroit area.

Wiesner-Rapp appoints

■ Burt Bathke has been named sales manager of the Kelley Machine Division, The Wiesner-Rapp Corp., Buffalo, N. Y. He will conduct a nationwide sales campaign covering Kelley's complete line of contractors' equipment.

Snow-removal, sanding costs high in Montana

■ The severe winter weather in Montana last year cost that state $671,889 for snow removal and $531,141 for sanding, for a grand total of $1,201,030. This is an average of $208.46 per mile. The Maintenance Department of the Montana State Highway Commission kept 5,771 miles of roads in repair and traveling condition.

AVALANCHE!

Highway maintenance crews use howitzer to trigger snow slides in Colorado's high mountain passes

WINTER WORK

Travelers crossing Colorado's mountain passes between November and May are likely to be surprised when they suddenly come upon a gun crew preparing to fire a 75-mm howitzer into the mountains. This isn't a military maneuver; the gun crewmen are in ordinary work clothes, and a highway-department pickup stands nearby. Nor is it practice. The enemy is that accumulation of snow, up on the mountainside, that may come down without warning, brushing away anything in its path and possibly snuffing out lives as it sweeps across the highway. While flagmen hold back traffic on both sides of the slide area, the gun crew slips a round of standard ammunition into the cannon and fires. A puff of white high up on the mountain indicates the location of the hit; seconds later, the sound of the exploding shell drifts back down the valley. If there is no snow movement, the crew may try shots into slightly different locations. If nothing happens, the slide is considered temporarily stable, and traffic is

(Continued on next page)

Maintenance men fire a howitzer to bring down a heavy accumulation of snow that threatens to engulf the road. Azimuth and elevation data help them place a shell on target even in the storm.

If a slide is brought down, the road is temporarily closed, traffic is detoured around the area, and rotaries, like this Snogo, are put to work. Cleanup generally takes from a few minutes to a few hours.

A slide triggered by a shell from a howitzer roars across a highway in the Colorado Rockies. The highway department's howitzer crew placed the shell at the shear line, where the snow has broken loose from the pack.

A howitzer shot sets off an avalanche in the Eagle Slide area. The snow mass has already covered the upper road and is about to cover a stretch of the lower road.

(*Continued from preceding page*)

resumed as the gun crew moves ahead to the next area.

Here, a shot carefully placed at the cornice or fracture line near the top of the mountain triggers an avalanche, sending hundreds of tons of snow cascading down the mountainside and across the highway, and bringing with it trees, branches, rocks, and other debris. The avalanche completely blocks the highway with a pile of snow that may be 10 to 15 feet deep and several hundred feet long. Though traffic is temporarily blocked, maintenance foreman Pat Murray and his crew breathe more freely. If the slide had let go naturally, it might have buried some passing motorist.

Pat's first act is to step to his pickup and use his RCA mobile radio to notify district maintenance superintendent Charles Kempf and the State Highway Patrol that the slide has been brought down and the road is blocked. Patrol cars and maintenance employees intercept traffic at key points, detouring it around the area if possible, or notifying motorists of the delay while the slide is being cleared away.

As soon as the slide has stopped moving, maintenance crews with Snogos and other rotary plows begin hacking their way into the huge pile, throwing the snow in a cloud down the mountainside below the road. If the slide does not contain too much debris, the rotaries may cut through in a few minutes to a few hours, restoring traffic on a one-way basis while they go back to clear the full roadway.

When the slides contain boulders or large pieces of wood, the rotaries are in trouble. They shear pins or bog down entirely. When this condition appears imminent, Pat calls in his Cat D7 dozer or one of the rental tractor-dozers that are always on call. The dozers are slower, but they take trees, rocks, and other debris in stride.

Slides are named

Slide areas on U.S. 6 over Loveland Pass (Elevation 11,992) and on U.S. 40 over Berthoud Pass (Elevation 11,315) are among those shot regularly by the area maintenance crews. The six slide areas on Loveland and eight on Berthoud are well known to the men on these crews. In fact, the areas are all named or numbered for easy identification. One of the best known is the Seven Sisters site on Loveland Pass, where seven separate gullies develop slides in a single area.

All of the slide areas are carefully marked out with signs that warn highway travelers not to stop within these limits. On clear days the are... are easily visible. Avalanches ... after year have cleared away most ... the timber and brush so that ... slide area is a semibarren slash ... the steep mountainside.

The methods used by the Colora... maintenance men are adapted fr... those used successfully by the Sw... and Austrians in the Alps. The slid... areas are carefully studied; such fac... tors as the amount of snow and i... weight and water content, the tem... perature, and the degree of slope ... the mountainside are taken into ac... count. When a study indicates that ... the slide may be nearly ready to ...

New power! New design! New features! Plus a new drive option—Cat pow... shift transmission! The result: higher production on any application!

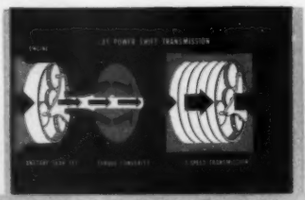
Now the "King of the Crawlers" is better than ever with new pace-setting capacity for higher, faster, lower-cost production on *any* big tractor application!

The biggest "new look" in the giant D9 Series E is the undercarriage. It's more massive . . . more rugged than ever. It'll add hours of life to running gear on even the toughest jobs. *Every* track component is new in design, highlighted by a big, new link—its pitch is increased 1¼" to 10¼"! And a new Caterpillar-developed steel alloy strengthens links, shoes, rollers *up to 40%!*

That's not all: the new D9 packs more power—335 ... Its new equalizer bar gives greater stability on any ter... for greater operator confidence and production. A wi... seat with a new spring-loaded adjustment mechanism ma... the operator more comfortable, more efficient. No de... has been overlooked to make the new D9 handle hea... loads faster—and at lower operating and maintenance co... than ever.

And that's not all. Now, along with direct drive ... torque converter, you have your choice of the new ...

Dry-type air cleaner. Removes at least 99.8% of all dirt from intake air during every service hour. Can be serviced in 5 minutes. Reduces maintenance time and cost.



Exclusive feature. A planetary gear set splits the power from the engine. Part goes directly to the 3-speed transmission, the rest goes through a torque converter to transmission.

New sprocket. Sprocket is strengthened by new design with increased tooth thickness. Hunting tooth action provides slower wear rate.

New 335 HP. More powerful ... ever, the D9's Turbocharged ... gine has the capacity to ha... bigger loads faster, with ... pendability, economy.

New Turbocharger. New, compact turbocharger packs more air into the engine. Open impeller wheel (shown below) helps prevent dirt build-up.

New power shift transmission. Optional on the D9. With this development you can shift on-the-go under full load with one lever and no clutching in a split second!

New, bigger, more rugged undercarriage. Major improvements in all track components add hundreds of hours of life to running gear—hours that mean more time on the job.

New equalizer bar. Greater ... bility. The rocking action of ... bar shifts more weight ... up-hill track.

...eak loose, the gun crew goes into ...ction.

The gun, a standard 75-mm mountain howitzer, is lent to the highway ...partment by the Colorado National ...ard, which also supplies the am...unition, of standard military type ...th contact fuses. Shells burst too ...r away from the road to endanger ...yone.

Shots are made from fixed positions on the highway, well back from ...e slide area. The exact gun placements are known to the crew. At each ...ting, the crew has logged the ...zimuth and elevation reading that ...liver the shell to the critical point of the slide. With this information, it is not even necessary to see the impact area in order to make effective shots. The slides can be shot during snow storms or when clouds obscure the target area. Sometimes the shots carry as far as 1¼ miles from the gun emplacement to the fracture line of the slide.

When any one of the slides is considered "ripe" for shooting, the gun crew usually shoots them all in succession. While the crew seldom triggers more than one or two slides in such a series of shots, minor movements are sometimes caused, and these help consolidate the snow.

Use patrol system

While the shooting and cleanup of the slides is probably the most spectacular of the winter maintenance operations, it is a small part of the over-all winter program that keeps Colorado's twenty-one mountain-pass roads constantly maintained and safe for winter travel.

The basis of the maintenance program, both summer and winter, is a patrol system in which two or more men are assigned to a 20 to 25-mile section of road. These men have trucks, plows, sanders, motor graders, or other equipment, depending on the conditions usually encountered in their particular area. Patrols operating over the high passes have extra men and machines.

The howitzer is in position to bring down a slide. Maintenance crews have cleared the road of traffic; if the slide comes down, vehicles will be detoured. If a few shots do not move the snow pack, it is considered stable enough to present no hazards to drivers.

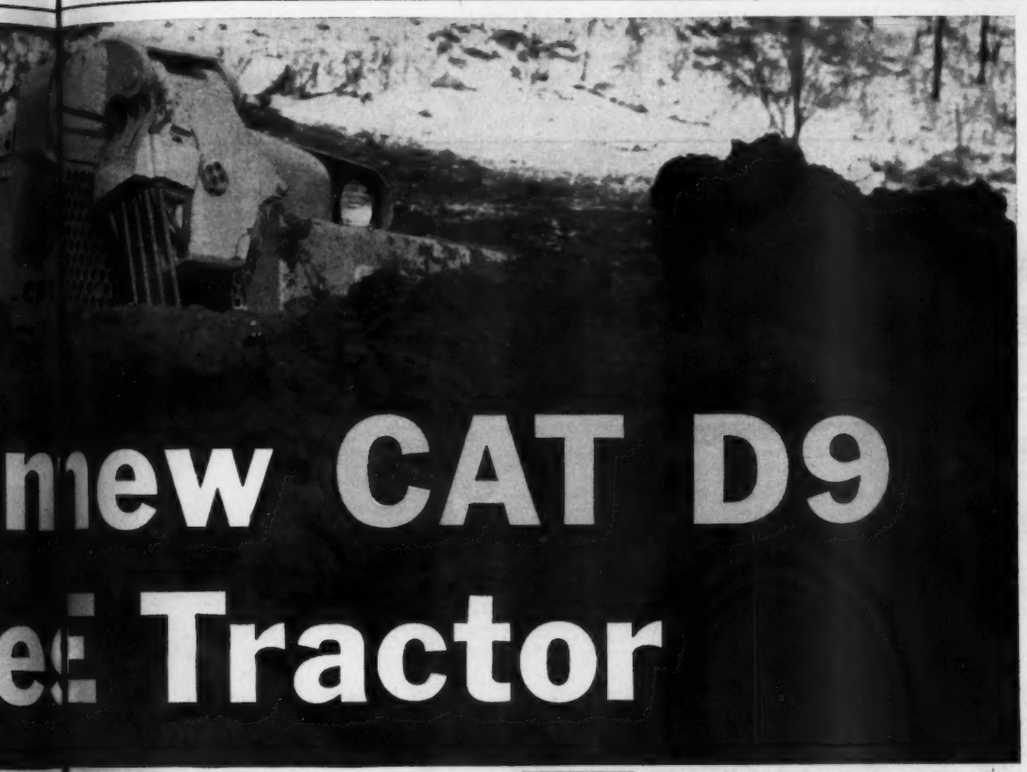
Several patrols are placed under an area foreman who supervises their activities and who directs any or all of the manpower and equipment to specific areas as the need arises. The area foreman reports to one of the seven district maintenance superintendents who operate through the district engineers. All patrols in the mountain areas are equipped with 2-way mobile radios.

During the summer months, the snow-removal equipment—such as plows, rotaries, trucks, and sanders —is taken to the central shops in Denver for a complete overhaul that puts them in top condition.

Before the snow comes, preparation for winter begins. Markers are placed in the shoulders along both sides of the roadway where deep snow is anticipated. These are 2 × 2 posts, 8 to 10 feet long, painted with alternate 1-foot bands of black and aluminum. The inside of the sidehill cuts is indicated by a marker with a black section at the top; an aluminum-topped marker indicates the outside of the roadway. When the drifts or

Area maintenance foreman Pat Murray, right, uses his RCA mobile radio to notify headquarters and the State Highway Patrol that a slide has been shot down and the road is closed. At left is assistant district maintenance superintendent Bob Patton.

←For more facts, circle No. 258



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...er shift transmission. This revolutionary transmission, ...ed under the most rugged conditions, combines for the ...t time the positive feel of direct drive with the flexibility ...d anti-stall features of torque converter. With one control ...er and no clutching, it reverses direction . . . changes ...ed . . . smoothly . . . under full load . . . in a split second! Many of the new features, along with some familiar ...ined features, are shown here. Look them over. They'll ...e you an idea *why* the new D9 can mean higher produc... and more profits for you. For complete facts, see your ...terpillar Dealer. Ask for a demonstration and watch ...s giant eat up the work!

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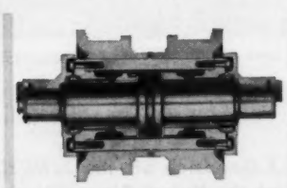
NEW D9 SERIES E—
BORN OF RESEARCH
PROVED IN THE FIELD

Previous track link

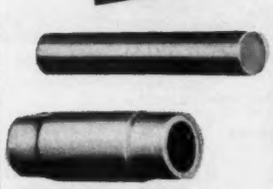
...of hardening

...deep hardening steel. ...last gives better visibility ...the rear and tapered hood ...unscalled forward vision.



Lifetime lubricated track rollers. Lifetime lubrication eliminates servicing problems. Oil is retained by dirt-proof, floating-ring seals.

Stronger track shoes. New alloy permits deeper hardening in wear areas. Grouser height is increased ⅜" for better penetration and prolonged service life.



Larger pins and bushings. Diameters are ¾" larger, increased size reduces deflection and provides better contact along the length of the wear surfaces.

New foot decelerator. Provides easier machine positioning. Allows deceleration without taking hands from controls (optional on direct drive, standard on others).

New seat adjustment. New spring-loaded adjustment mechanism provides more positive cushion and back rest positioning. Wider seat for more comfort.

Bigger, heavier track links. Strength has been added in stress areas. Pitch increase from 9" to 10¼" strengthens all track components.

When banks along the road build up enough to slide and block the highway, crews load them with dynamite and shoot them to make the road safe.

(Continued from preceding page)

The detonation brings down the overhang on the west side of Loveland Pass. The snow is cleared away by plows or rotaries in a short time.

slides are very deep, it is important for the workmen to know if the marker they see sticking up out of the snow is on the inside or the outside of the roadway.

Another preparatory job is that of stockpiling abrasives and chemicals for treating slippery road surfaces. At lower elevations, salt or calcium chloride is mixed with sand as the stockpiles are built. In the higher mountains, pure sand is most commonly used. The sand is stockpiled at convenient points and is loaded into the sanding trucks with Hough tractor-loaders.

When it starts to snow—day or night, on any day of the week—the patrolmen go to work. Their first job is to check their section of road for vehicles in distress and get all people to safety. Then they start sanding or plowing, as conditions require, and stay on the job until the storm is over

B.F.Goodrich

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No matter how big the tire, how intricate the equipment, how complicated the repair, our B.F.Goodrich Tire Service Men can handle the job. Their special training pays off in expert, efficient workmanship.

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B.F.Goodric

and the roads are clear. This may be a few hours or several days. The roads are seldom closed for long.

Signs on the approaches to the mountain passes state that chains are necessary. There is no enforcement of the chain requirement, however, and many motorists try to get through without them. Some are lucky enough to make it, but others spin out of control into the snow banks or lose traction on the steep grades and hold up traffic behind them. These drivers create the biggest headaches.

The five patrols under the supervision of foreman Pat Murray maintain 200 miles of road, including three high passes. The 30 men who make up the winter personnel of these patrols have at their disposal a spread of equipment that includes three Cat 12 motor graders, one equipped with a Domor power wing; an Austin-Western 99 motor grader; 13 Wausau blade plows on Coleman, FWD, and 4-wheel-drive Ford trucks; two Snogos; a Bros rotary plow; four Hough tractor-loaders; a Cat D7 tractor-dozer; five dump trucks; and Good Roads sanders for a number of the trucks. While some of this equipment is regularly assigned to the patrols, it can all be shuttled to points where it is needed in emergencies.

The maintenance of the roads in the Berthoud, Loveland, and Squaw Pass area under foreman Pat Murray is just one example. Five such area foremen report to maintenance superintendent Charles Kempf, who reports directly to district engineer George N. Miles of the Denver District. A. V. Williamson is staff maintenance engineer for the Colorado Department of Highways, and Mark U. Watrous is chief engineer.

THE END

A Snowblast rotary plow is tested in the Eagle Slide area. The powerful rig works at high speed as it throws snow from the road. Of Swiss design, it was assembled in Denver.

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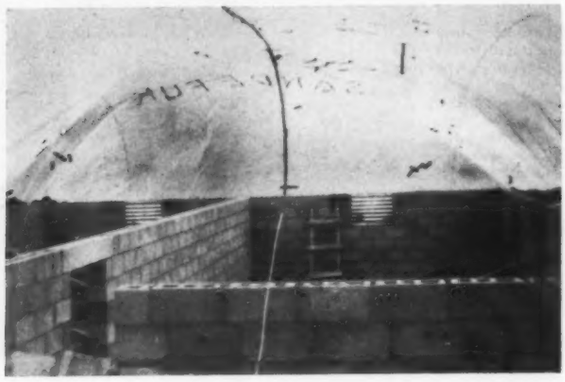
...es and service

Tricks of the Trade

Winter job carried on in a "bubble" of plastic



When it got too cold to continue building-foundation work outside, Sandefur & Sons, Columbus, Ohio, put up an air-inflated plastic "bubble" to protect the work and the crew.

The shelter was built by the contractor with two 100-foot rolls of 6-mil Visqueen film, 25 feet wide. Widths of the film were overlapped on a smooth surface provided by a knocked-down cardboard carton. The edges were heat-sealed with a conventional iron; a thin pressing cloth prevented the plastic from sticking to the iron.

At the site, the film was unrolled over the building foundation and inflated with a 15-inch blower to form the protective "bubble." Rocks and loose dirt held the edges firmly in place. Slits in the film allowed men

to enter the structure. These slits were overlapped and secured with concrete blocks.

Inside the bubble, men worked in comfort, a single 125-Btu portable oil burner supplying heat on the coldest days. The translucent plastic admitted plenty of light for crews to work.

Though strong winds occurred while the enclosure was in use, only small tears developed in the plastic, and these were easily patched with tape.

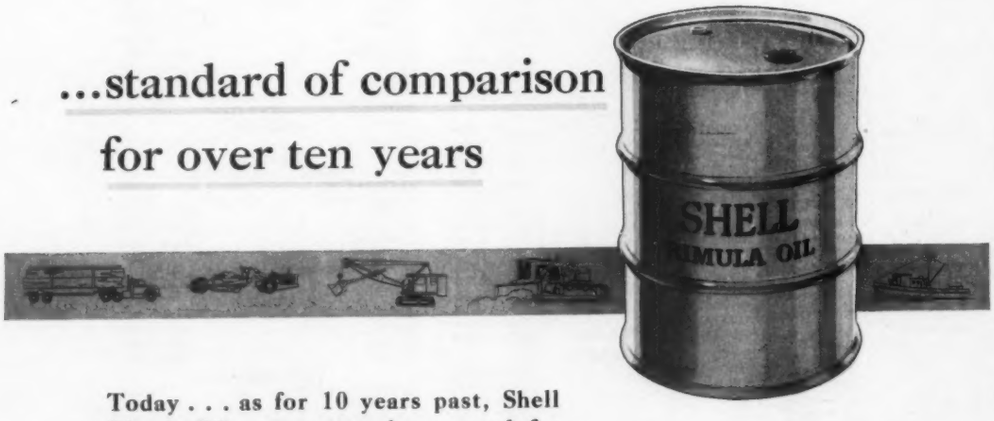
Heater on pickup brings TractoLoader to operating temperature

As long as temperatures at North Pole, Alaska, keep above the minus 20-degree mark, Wright Bros., hauling and excavation firm, keeps its fleet of trucks and tractor shovels operating on snow-removal jobs—some of them large operations for such private concerns as Standard Oil and Union Oil. To get its Allis-Chalmers TL-20D TractoLoader up to a smooth operating temperature in the cold weather, the firm uses a 40,000-Btu Silent Glow electric heater in the back of a pickup truck. The pickup simply backs up to the Tracto-Loader, and a long flexible tube, about a foot in diameter, is linked between the heater and the underside of the loader. In about an hour, the TractoLoader is ready for work.

The winter snow-removal operations put the firm's work on a year-round basis. During the short construction season, which extends from

Today's finest crankcase oil for super-charged diesels

...standard of comparison for over ten years



Today . . . as for 10 years past, Shell Rimula Oil proves more than a match for the greatly increased engine ratings, high temperatures and pressures of modern high-performance diesels. Rimula® Oil successfully tends to resist every destructive force that accelerates engine wear.

Let a Shell Representative show you the benefits of using Shell Rimula Oil. Write to Shell Oil Company, 50 West 50th Street, New York 20, New York, or 100 Bush Street, San Francisco 6, California. In Canada: Shell Oil Company of Canada, Limited, 505 University Avenue, Toronto 2, Ontario.

SHELL RIMULA OIL

—the heavy-duty diesel lubricant

SHELL

For more facts, use Request Card at page 18 and circle No. 260

about May 1 to October 15, the firm deals largely in subcontracts for excavation and hauling of sand and gravel for both defense and commercial construction projects. Its operations extend about 100 miles, from Fairbanks south to Big Delta. Taking advantage of the long hours of daylight, the company works 16 hours a day, 6 days a week. The TractoLoader gets in plenty of work in this time. With a carrying capacity of 9,000 pounds, the rig uses a 2½-yard bucket to load the truck fleet with sand, gravel, and crushed rock. When job locations change, the diesel-powered rig is driven from job site to job site, arriving ahead of the trucks.

Right now, Wright Bros., Hauling & Excavation, is getting ready to make the switch to winter operations, following a job at Eielson Air Force Base, where the old runway was replaced with a much longer one, and another job that called for clearing a proposed site for a runway extension for the Fairbanks International Airport.

Rock wagons dump water along haul road to control dust

A contractor on an interstate highway job in Boston, Mass., took a new approach to solving the dust-control problem on his haul roads.

The roadway crosses a reservoir, and along this alignment a crane with clamshell was being used to excavate peat. After a Cat DW21 rock wagon came up and dumped its load

of blasted rock from the roadway excavation, the crane would fill the wagon with water, which the rig dumped on the haul road on its return trip.

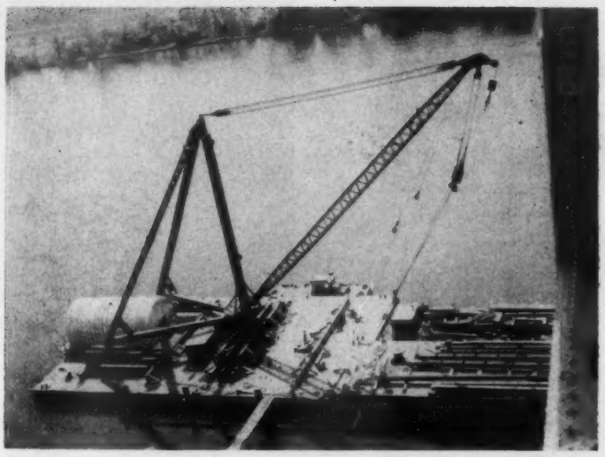
By using water for the road, C. J. Maney Co., Inc., Lexington, Mass., did away with the need for spreading calcium chloride to keep the dust down. The method can be used effectively and inexpensively on any job located near water or having an abundant water supply.

Metal housing protects derrick barge equipment

To protect the hoisting-engine equipment and the operator against the elements, Harris Structural Steel Co., New York, N. Y., assembled a metal hoist house on a derrick barge.

The prefabricated sections, produced by the Wonder Building Corp. of America, Chicago, Ill., provide a cover for hoisting equipment powering the 150-ton stiffleg derrick.

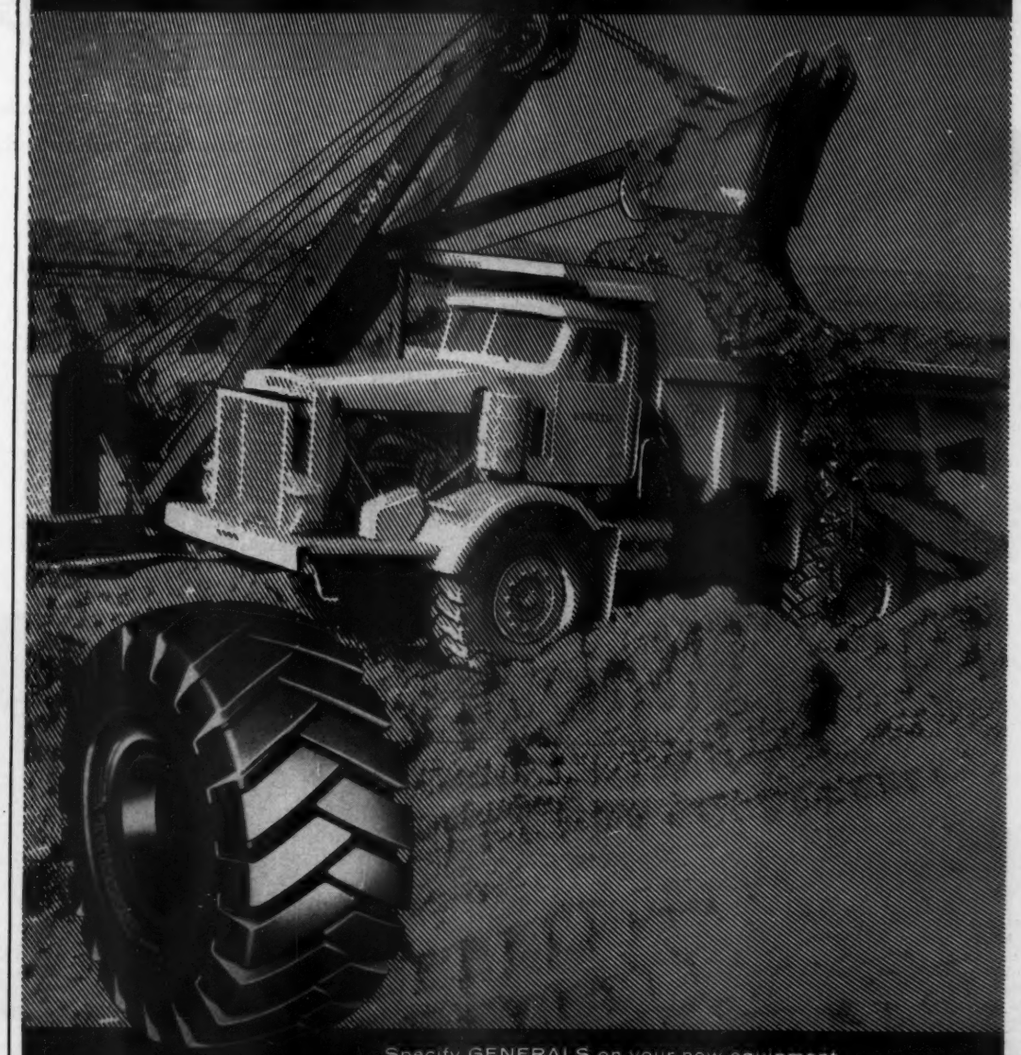
The housing was erected on the barge at the site of a Harris bridge job on the Hudson River. The derrick barge will set approach steel on the Throgs Neck Bridge between Queens and the Bronx.



When you've got a tiger of a job by the tail and every extra trouble-free turn of your wheels means money in your pocket, you need stronger, NYGEN-built

GENERAL TRUCK TIRES

. . . the astounding tires that have proved their worth haul after haul . . . job after job!



Specify GENERALS on your new equipment

THE GENERAL TIRE & RUBBER COMPANY, AKRON, OHIO

For more facts, use Request Card at page 18 and circle No. 261

WINTER WORK

The Peter Snow Miller figures importantly in work on runways of snow a "underground" snow shelters and storage huts in Greenland. The Swiss-made machine has cutting blades on a large rotating drum that creates the necessary draft to throw the material through an elephant trunk.

One pass of the Snow Miller provides a trench to start an underground shelter. Guide rails are being installed for the machine, which makes wider successive cuts. Trenches can be made up to 32 feet deep and 24 feet wide at the bottom.

The operator follows the guide rails at the top of the cut as the trench gets deeper. The technique builds some of the strength of an arch into the roof and leaves only a small area to be roofed over. At this point, the Snow Miller has made six cuts.

Corps learns

Greenland research by Army provides vital information for cold-weather jobs

Ever hear of "reinforced ice" as a structural material?

Or just plain, ordinary snow as a structural material?

Or installation of a complete refrigeration unit under a building well within the Arctic Circle?

Or construction of a military base —with living quarters, machine shops, heating plant, recreation hall, and storage areas—50 feet under the surface of the snow?

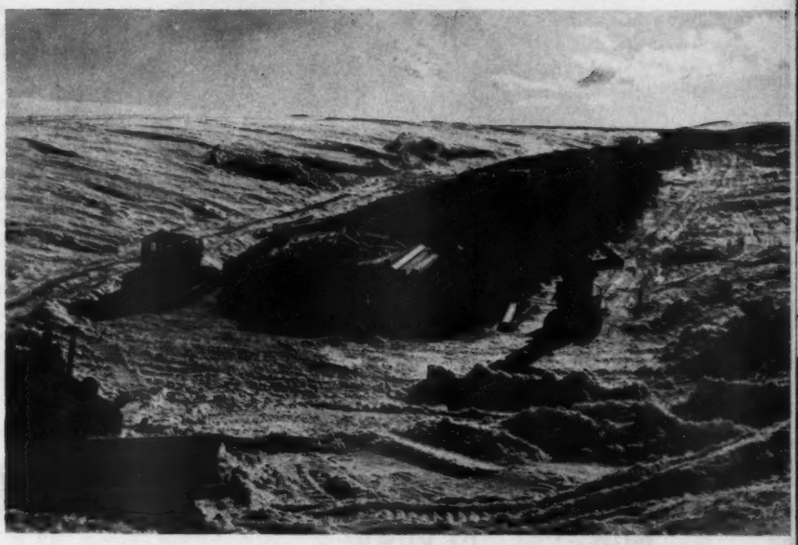
Excluding the reinforced ice, which is being worked on right now, all of this exists today. It is the product of the U. S. Army's Corps of Engineers, after six years' work in Greenland, and many more years of work by the Corps and other agencies in Arctic and other cold areas. The information developed is of vast importance from an immediate military point of view. It also promises to be important as more work is undertaken in cold areas—for instance, in Alaska.

The Corps has been systematically learning not only how to survive in permanently frozen areas (after all, Eskimos have been doing that for centuries) but how to make use of

Another job for the Snow Miller: casting snow back over steel forms that have been placed over the trench to form the roof. The snow is built up to a depth of about three feet and allowed to harden before the steel arches are removed or slid along, much like traveling forms.

Permanent living quarters in the caverns are heavily insu to keep men warm and also to prevent the snow from me This is an early installation at Camp Fistclench on the icecap, when it was felt that some permanent support needed for the top of the trench. Such supports have since eliminated in building these caverns.

On-the-site tests of properties and structures of snow and ice are performed in one of the undersnow laboratories. The caverns can be used for nonheat-producing activities without further support or construction.



Road building on permafrost or snow requires a heavy blanket of gravel—up to 9 feet thick—to provide ventilation so that underlying material will not melt and make the base unstable.

ns work with snow and ice

by E. E. Halmos, Jr.

what's available in such areas so that man can live and work productively under these adverse conditions.

The studies and field experiments —still going on—have brought new knowledge to four areas:

1. The use of ice and snow as a construction material.

2. Methods for building on permafrost, or permanently frozen ground.

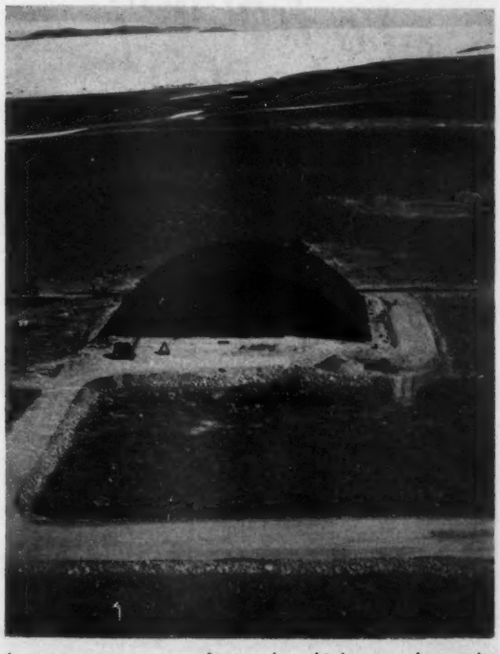
3. Development of machines, equipment, and fuels that can work under subfreezing conditions.

4. Training, equipping, and clothing men for productive work when operating in extremely cold areas.

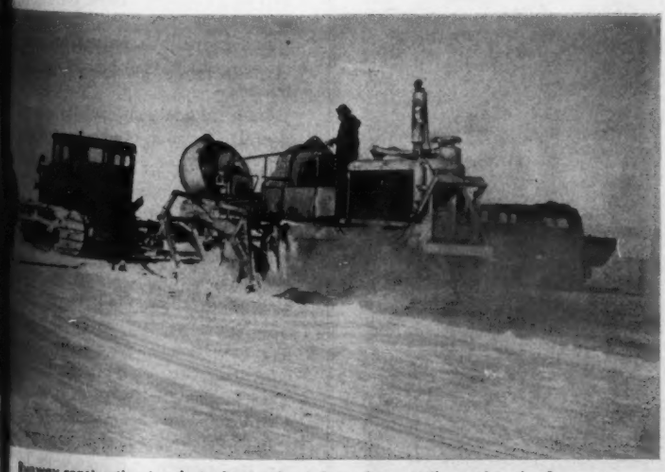
A map of the world shows vast areas buried under unimaginable tons of snow and ice. The whole northern rim of Canada, parts of Alaska and Greenland, much of northern Russia and Siberia, and areas around the Antarctic continent are permanently white.

And in other places—the northern United States and much of Canada for instance—there are conditions sufficiently similar to make some of the Corps' findings valuable.

(*Continued on next page*)

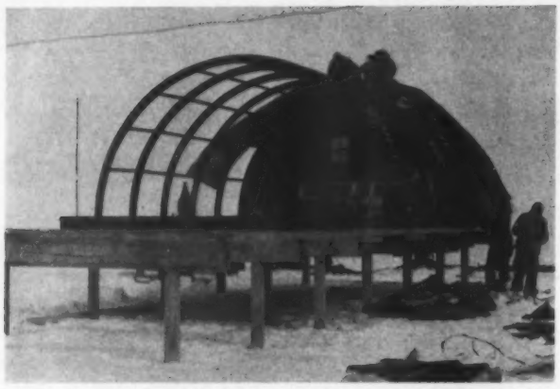


Large structures on permafrost, such as this hangar, also require a gravel blanket to provide ventilation. Air ducts or cooling systems keep the permafrost from thawing.



Runway construction is relatively simple. A Peter Snow Miller makes the first pass. The ground snow goes through an elephant trunk into a spreader box to be redistributed behind the plow. Second and third passes may be made; then the snow is spread and rolled.

Tunnels built in ice provide cold-storage areas and a high degree of protection for transportation, shops, quarters, etc. A Joy continuous miner with a bank of chain saws shaves the ice in a 1,150-foot tunnel near Camp Tuto.



Temporary buildings are built on stilts so that snow can blow under them instead of building up around them.

(Continued from preceding page)

The Corps' work in Greenland is being done under extreme conditions. But if the methods it develops are successful there, they should be successful in other areas that are not as cold.

Greenland, a vast island 1,670 miles long and about 650 miles wide at its widest point, has been found by seismic methods to be a vast bowl. Areas in the middle of the bowl are believed to be below sea level; the rim is made up of an almost continuous mountain range that has peaks as high as 5,000 feet. The island's total area is about 850,000 square miles, with less than 45,000 square miles considered to be habitable.

The enormous expanse of the bowl is filled with ice and snow, the ice having been formed over the ages by the pressure of snow piling up in an area where temperatures never rise above freezing, except at the edge of the sea. The ice and snow that form the island's famous icecap have thicknesses estimated to exceed 10,000 feet, the top 200 feet of it snow. Snow storms keep adding to the surface, compressing material that has already fallen and forcing the vast mass to move slowly to the edges of the island and spill over the mountains in the form of glaciers.

Snow for building

The urgent need to use Greenland for defense—and for future development—prompted the U. S., with Danish approval, to learn as much as possible from this wasteland.

The Corps' Special Projects Branch under the direction of R. R. Phillips, who had been brought in by Lt. Gen. Lewis Pick, then Chief of Engineers, first looked over materials available for construction.

There's no wood, little earth that isn't frozen, and nothing else. Any conventional construction materials would have to be flown or shipped in.

But there is snow—hundreds of thousands of square miles of it—that never melts. And the engineers set out to find what could be done with it. Here are some of the things they learned:

Snow has physical properties not unlike sugar sandstone in a permanently glaciated area such as Greenland. Under compression and tension, the snow has a remarkable strength that is comparable to a weak concrete. Cores taken in the Greenland icecap at a depth of 50 feet showed the snow to have a mean crushing strength of about one-tenth that of concrete—303.9 psi in unconfined compression and as much as 600 psi at extremes. In tension, the 50-foot cores showed a strength ranging from 160 to 700 psi at extremes.

Glacier ice has compression strengths of some 650 psi, with extreme values to 1,000 psi, and about 400 psi in tension. This glacier ice differs from other ice in that it is granular and was formed by compression rather than by melting and freezing.

Snow, in addition, exhibits a considerable amount of plastic properties, as does ice. It can yield under pressure, yet still maintain its strength properties. The reason for this surprising strength is the fact that the snowflake itself is a most impermanent form. Almost immediately after falling, the flake becomes what engineers call "neve"—a granular formation. These granules grow on contact with others by sublimation. Thus the material takes on strength with loading and compaction.

But because the material is granular, its strength can apparently be increased by processes very similar to vibration processes in sand. When

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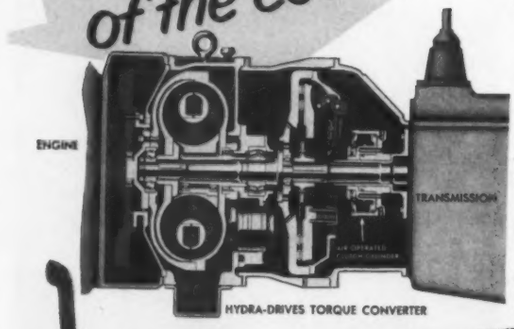

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is shaken up, more points of contact are provided between granules. With this knowledge, actual construction can be done with snow as the principal material.

The most successful use of snow for building has been in two areas—for "underground" storage and living quarters, and for runways and roads able to take the enormous loads imposed by modern cargo planes and heavy trucks. The snow is thrown, or cast, rather than being pushed into place; and, so that it can achieve its greatest strength, the snow is not rolled or otherwise compacted.

Runway construction

Here's how a runway is built in Greenland. After the site is selected, the runway width and length are determined. On the icecap, there's no problem in leveling or clearing; the whole area is smooth and level with no cracks or crevasses. (These occur only at the edges of the icecap.)

A first pass is made with a plow that has a series of blades mounted on a drum to create draft. This is similar to the Snogo used in many U. S. cities for snow removal. (The Corps has been using a Swiss machine, the Peter Snow Miller.) But the plow used in Greenland runway construction is equipped with an extra-long elephant trunk that can throw the material to the rear.

The plowed snow, churned and actually ground by the cutting blades and its trip through the trunk, goes into a spreader box that redistributes the material behind the plow.

This process has been found to densify the material to a point where 3 feet of snow removed on the initial cut now packs down to about 1½ feet. Actually, the runway could be used at its 300-foot width after this first pass.

Now, the crew waits for the trench that has resulted to fill up with new snow. In Greenland, there's no doubt that a new snow storm and drift will occur. A second pass is made over the new deposit of snow, the rotary plow cutting above the first "lift." But this time, material passes through a rotary tiller machine similar to a Pulvi-Mixer. A snow spreader (the screed) and a conventional blade grader follow to level the runway, and this may be followed by a roller made of corrugated pipe weighted with sand or concrete.

If the runway is to be used by heavy planes, this is the end of the job. The runway merely has to be marked for pilots before operations can be started.

If the runway is to be used by smaller planes with higher tire pressures (such as fighters), a third pass is made. Again, the rotary tiller is used, but this time, heat from a battery of gun-fed oil burners gives the runway a foot or so of "hard surface."

Using a similar technique, engineers have found that they can cut relatively deep trenches, roof them over with snow arches, and use the trenches for everything from storage to living quarters. Although tunnering can be done in snow, the trenching method has been found cheaper and easier.

The trick is to open a comparatively narrow trench, then widen it in successive benches as it gets deeper. This gives the roof a stepped-up appearance, but it builds in some of the strength of an arch and leaves only a small opening at the top to be roofed over.

In this process, the same Peter-type rotary plow is used, now with its trunk elevated to cast the material away from the trench. The

(Continued on next page)

Glacial moraines provide nicely graded material for bases under buildings and roads. Because of the difficulty of excavating permafrost, all construction is done above ground.

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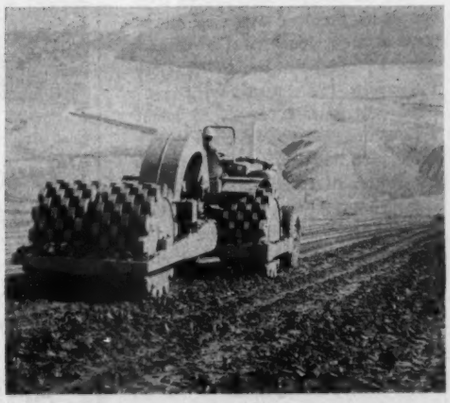

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A runway is given a final rolling with a galvanized pipe roller. Sand or concrete is used to weight pipe used for rolling runway surfaces in Greenland.

(Continued from preceding page)

plow opens an initial trench about 5 feet deep. The second cut, made in two passes, goes down another 5 feet and is wider than the first by several feet. The third and fourth cuts widen the trench even more; the final trench may be as much as 32 feet deep and 22 to 24 feet wide at the bottom.

The next step is to place buildings inside the trench, then place arch forms over the top. Snow is cast over the top forms to a depth of about 3 feet. After the snow has hardened, the forms are removed or slid along the top of the trench, much like traveling forms in concrete work.

Though installations built to date have been provided with vent piping, special work for ventilation is not needed. The granular formation of the snow permits air to escape from or enter the caverns.

Structures placed in the trenches are heavily insulated to prevent excessive heat loss and formation of ice.

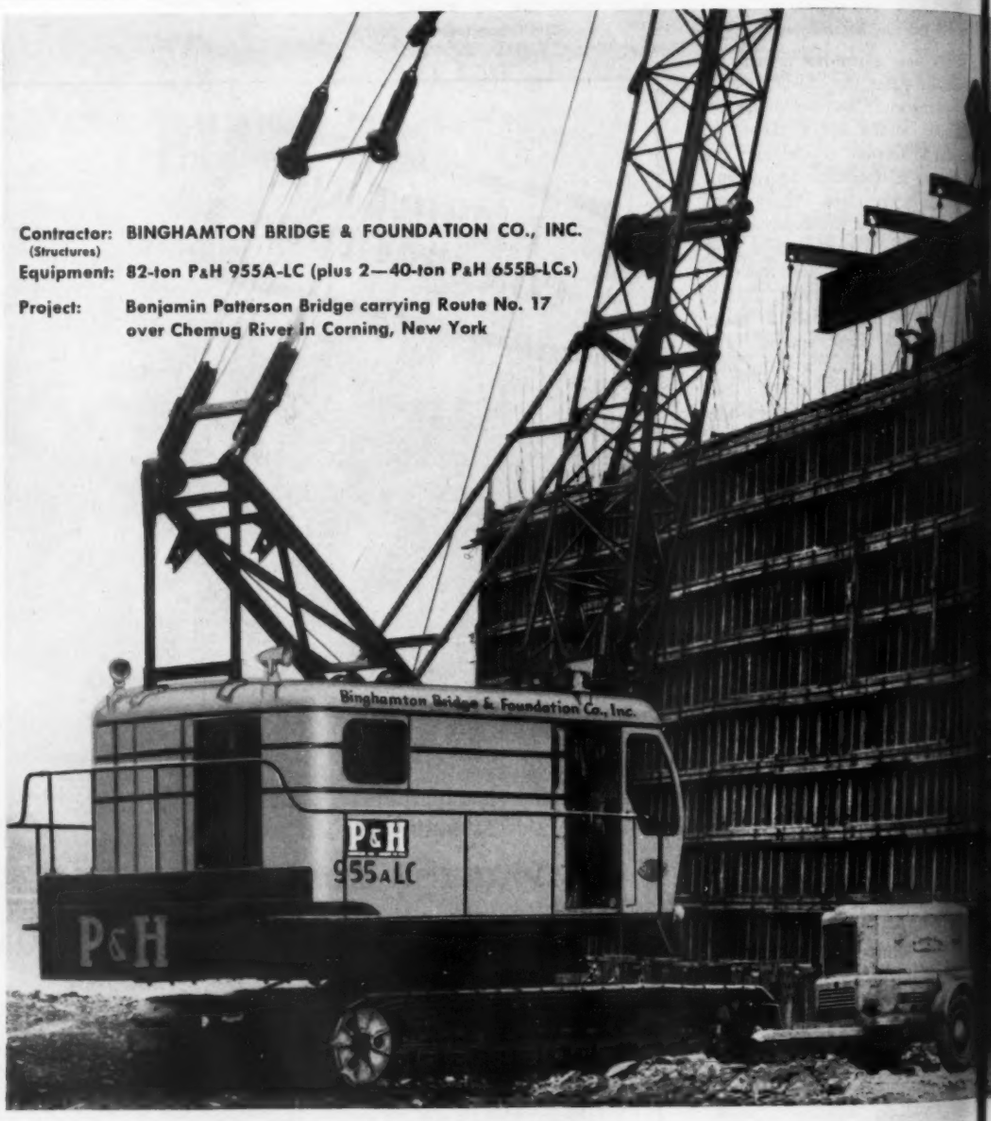
Drinking and cooking water is supplied from the icecap. A steam jenny is set working, and a pipe carrying live steam is allowed to sink into the ice as it melts the material. When it reaches a depth of about 150 feet, the pipe is suspended. Melted snow is pumped to the installations, and the rig continues to work until it has melted out a cavern perhaps 80 feet in diameter. Later, the pipe can be pulled up and put to work in another spot. The abandoned cavern can then be used for, say, gasoline storage.

These undersnow installations pose one major problem. The slow movement of the ice pack, plus accumulations of moisture, eventually close the cavern. The closure rate is comparatively slow; it comes to about 4 to 6 inches a year, or roughly 1 cubic yard per day per mile of tunnel or trench. Trimming the sides of a cavern poses another problem: disposal of the trimmed material.

When the tunnels have closed sufficiently, the engineers will abandon them and build new ones. There's plenty of snow available for construction.

Tunneling in ice

The snow cover extends about 200 feet deep, and below that there's glacial ice, which is also accessible at the edges of the continent. The glaciers coming down to the sea move fast—



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up to 90 feet a month in some spots—and in these areas there's nothing much that can be done in the way of ice construction. The ice here is too full of great crevasses, and the movement is too fast for anything approaching permanent work to be done.

But there are quiet "backwaters" in the glaciers where tunneling is feasible. Here, mechanical mining machines, such as the Joy continuous miner, can be used with conveyor belts to cut tunnels of almost any size and shape.

Such tunnels could serve two purposes. Since the temperature inside is an almost constant 10 degrees F, the caverns are natural cold-storage areas for food and other supplies. And tunnels through the ice can provide relatively easy access to the ice-cap of the interior, where travel on the surface is feasible by tractor trains.

In its work with the ice, the Corps is now experimenting with means of reinforcing the material — perhaps with glass fiber or plastics—on the theory that practical members, such as beams, can be cast for use in Arctic construction.

Problems in construction on permafrost have largely been solved—with one major exception. It is extremely difficult to excavate the material. Because it takes too much energy for the return in depth of excavation, construction is now entirely above ground.

There's only one rule that must be followed on permafrost: the foundation must be kept from thawing out the material under it; the permafrost itself must always remain frozen. Insulation alone isn't the answer, for some heat is invariably transferred. The real answer is refrigeration—much as that sounds like bringing coals to Newcastle.

Crews in Greenland have developed three insulation methods. The one used depends on the size of the structure to be built.

The simplest—for a small building—calls for a 4 to 5-foot-thick blanket of sand and gravel containing not more than 5 per cent fines atop the ground. The building is erected on cribs above this base. Normal air circulation dissipates the heat before it can touch the permafrost.

Larger buildings require a similar blanket, but good-sized air ducts are run through the blanket, and cold air is blown through them to aid in the dissipation of heat.

For very large structures, such as hangars, the installation of a full-dress refrigerator system, similar to those below artificial ice rinks, keeps the ground frozen.

This technique has been followed to keep the launching pad true for installations of missile batteries on permafrost. The difficulty of excavating permafrost is one reason that even ICBM bases in Arctic areas will have to be built above ground.

Modify equipment for cold areas

In its work, the Corps has not actually developed any new equipment, but it has figured out refinements on construction and snow-moving machinery.

Given a chance, says R. R. Phillipe, director of the Special Projects Branch, Corps machinery specialists would take earthmoving equipment and modify it for snow work. Treads would be made wider, for instance, and capacities of equipment—in terms of yardage—could be greatly increased because of the light weight of the snow.

But the Corps has learned some lessons about caring for equipment that are valuable for any contractor working in cold climates.

Use arctic fuels, not cold-weather fuels. The arctic fuels are a special class of refinery products, super-refined to eliminate impurities—mostly water vapors—as much as possible.

All machines should be winterized. And this is a special classification. Winterization, as developed in Greenland, includes these items:

1. Heated cabs provided for the operators. (The Corps is even considering enclosing the entire machine in a cab.)

2. Engines provided with heaters that preheat for starting. It is not enough to have heaters in the shop; machines must be so built that they can stop in the field and then be started again.

3. A special degree of tightness of the engine, its housing, the operator's cab, and other areas to prevent the fine, hard snow from sweeping in and clogging the carburetor or other vital parts. Filters must be easily reached and cleanable. Some machines are even provided with air jets to blow the drifting snow away from vital parts.

4. A good supply of spare parts. This is necessary, for metals are more brittle in the cold and failure is more likely.

5. Treads for machines. Treads

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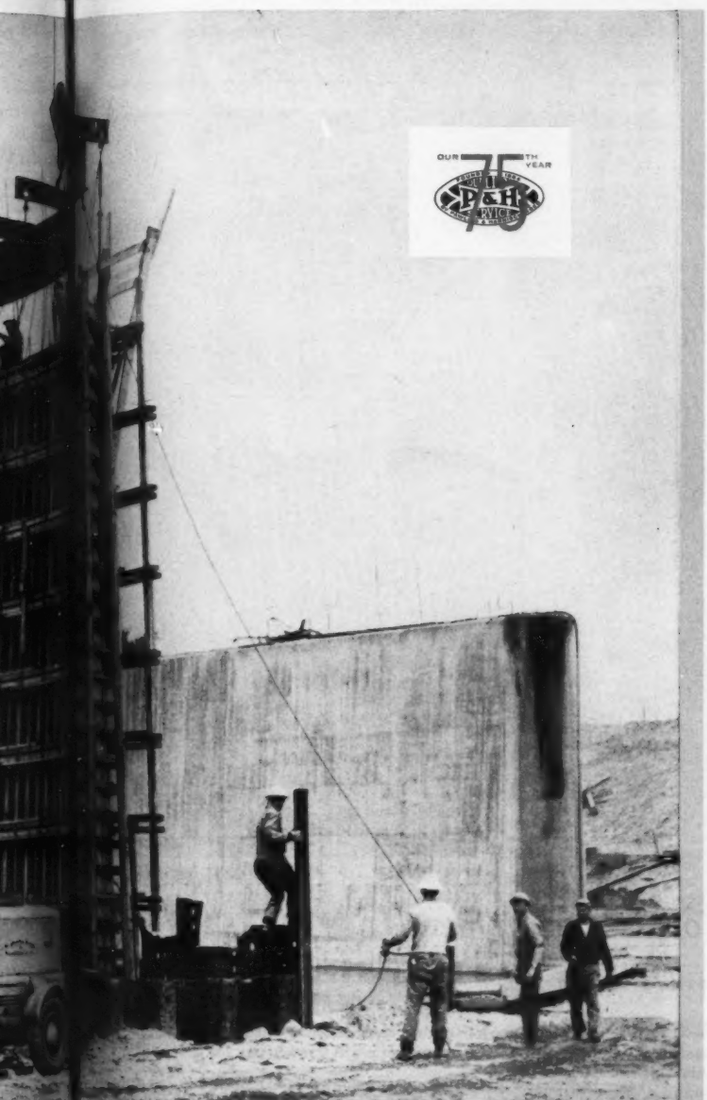

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Wide tracks on earthmoving equipment make the rigs better adapted to snow work. In the arctic climate, protection is provided for both the operator and the engine.

(*Continued from preceding page*)

have to be used, for rubber-tire equipment isn't practical. And the treads should be wider than usual for low ground pressure.

6. Some form of navigation equipment for working in extreme cold. Ordinary magnetic compasses and even radio are not dependable as navigation guides near the poles. Wire guidance systems and "sun compasses" are used.

The Corps has had a remarkable personnel record in Greenland and other Arctic areas. It hasn't lost a man or had a serious accident that could be attributed to the conditions under which the men were working.

The biggest problem in training men to work in the Arctic, according to Phillipe, is "to keep them from being either frightened or foolhardy.

"They must learn to treat their environment with respect and with caution," he adds. "It takes time, but once a man learns to handle himself he can do, as routine, work that would seem impossible on paper or at first glance."

Clothing is important, of course. The best type is as light as possible but highly impervious to wind and cold.

Hot meals, and hearty ones, are a must.

General health has been good, and this is no surprise. Greenland's climate is very dry, there is little or no plant or animal life, and diseases of native origin are almost unknown. But diseases brought in from outside can sweep a camp very quickly.

Dark glasses are a necessity, and they must be worn at all times during the six-month daylight period.

In sum, the Corps of Engineers has learned to use materials available in the bleak northland. It has also learned how to live and work. And much of what the Corps has learned will inevitably be put to use in cold, but less rugged, climates.

THE END

Sika assigns Guntin

■ Daniel Guntin has joined the technical sales staff of Sika Chemical Corp., Passaic, N. J. He will serve architects, engineers, and contractors in the metropolitan New York area.

For more facts on Insert, circle No.

Caterpillar manager named to U. S. committee

■ E. B. English, manager of the Defense Products Department of Caterpillar Tractor Co., Peoria, Ill., has been appointed to the U. S. Chamber of Commerce's National Defense Committee for the coming year. The committee studies national problems pertaining to defense-supporting industries and helps develop Chamber policies and programs.

Buffalo-Springfield shortens company name

■ The Buffalo - Springfield Co., Springfield, Ohio, has dropped the "Roller" from the company name. The name change is the result of a recent shift of the manufacture of Stardrill-Keystone drilling rigs and equipment to the Springfield plant.

Both Buffalo-Springfield and Stardrill-Keystone are divisions of Koehring Co., Milwaukee.

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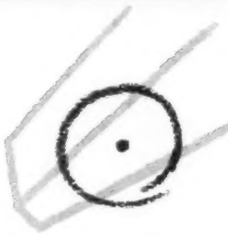

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Your local ESCO dealer can supply Points a Adapters for all your digging needs. By usi ESCO Points and Adapters on all your equi ment you can cut costs further by reducing yo point inventory and consolidating purchas Call your ESCO dealer today for details. He listed in the yellow pages of your telephone d rectory. Or, write direct.

ESCO Point shapes start sharp, stay sharp and last longer under any digging condition.

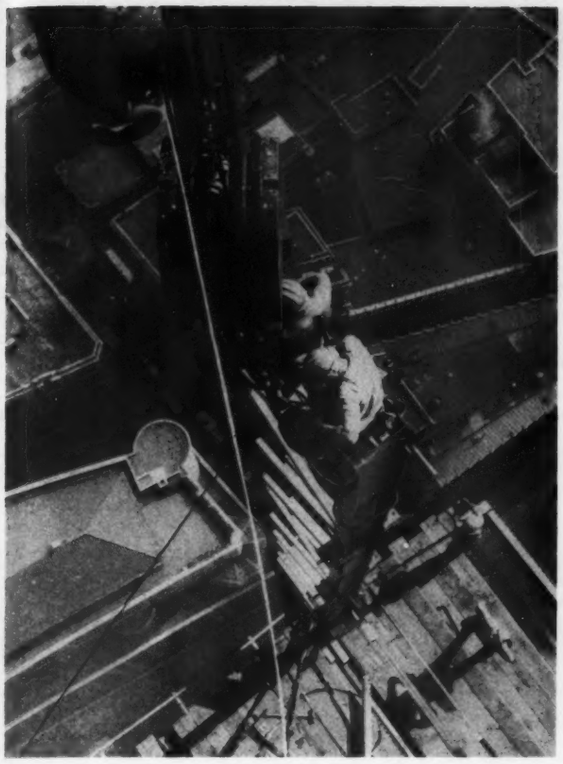
ESCO

Electric Steel Foundry Compan

2157 N. W. 25TH AVE. • PORTLAND 10, ORE.

MFG. PLANTS AT PORTLAND, ORE. AND DANVILLE, ILL.
Offices in Most Principal Cities
ESCO INTERNATIONAL, NEW YORK, N. Y. • IN CANADA

Chase Manhattan building tops out at 827 feet



◄ Ironworkers from Bethlehem Steel Co. cut loose the hook from a 70-ton-capacity guy derrick that placed the topping-out piece—a 47-foot member —for the Chase Manhattan Bank Building in New York City.

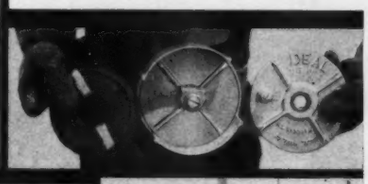
This bird's-eye view of the operation was made by a remote-control camera located near the outermost end of the derrick boom and about 900 feet above street level in the financial district.

What is believed to be a construction "first" marked the ceremonies. As the American flag was attached to the 47-foot column, closed-circuit television flashed the picture to four monitors on the sixth floor of the building, where guests and newsmen were gathered for the topping-out ceremony.

The $131 million building, 60 stories high, is the sixth largest skyscraper in the world and the largest built in the last 25 years. Topping out came a year after Bethlehem started steel erection and a year before the building is scheduled for occupancy—September, 1960.

Save Time...Save Wire
...Increase Production...
with the IDEAL REEL

Wherever wire is applied and tied—for re-bars, metal lath, insulation, warehouse bundling, and many other uses—the IDEAL TIE WIRE REEL will save you up to 33 per cent in wire and speed tieing by 25 to 30 per cent.



Right or left hand use . . . refills in seconds . . . handles 12 to 20 gauge wire . . . lasts indefinitely. Handy four pound wire coils are available everywhere in:

- Black Annealed
- Copper Clad
- Monel
- Galvanized Soft
- Stainless Steel
- Aluminum

. . . to suit every job requirement. Get the Ideal Reel success story and demonstration from your dealer or write for full information today!

IDEAL
TIE WIRE REELS

IDEAL REEL COMPANY
PADUCAH, KENTUCKY

For more facts, use Request Card at page 18 and circle No. 267

EXPANSION JOINTS ...
used wherever good design requires a top-quality joint filler in concrete construction

The "SEALTIGHT" line of time and job proven, top-quality expansion joints are specifically designed to meet the needs of modern, properly-designed, properly-jointed concrete construction projects. Ideal for pavements, runways, bridges, buildings, ramps, etc. Produced to strict quality-control standards . . . available "from stock" at your local "SEALTIGHT" distributor for immediate delivery.

MEMBER
EXPANSION JOINT INSTITUTE

SEALTIGHT®

PRODUCTS

- EXPANSION JOINTS . . . Asphalt, Fibre, Cork and Sponge Rubber.
- TONGUE and GROOVE Center Strip.
- Hot and Cold Rubber Asphalt Joint Seal.
- Hot and Cold JFR Rubber Asphalt Joint Seal.
- Air Entraining Agents.
- Curing Compounds.
- Curb and Gutter Sections.
- "PREMOULDED MEMBRANE" Vapor Seal.
- "SEALTIGHT" PVC Waterstops.
- "HYDROMAT" Asphalt Liners.

ASPHALT EXPANSION JOINTS
SEALTIGHT Premoulded Asphalt Expansion Joints have been in general use for more than 30 years. They provide initial low cost and durability. Entirely waterproof and rigid, they are highly recommended for most every joint installation. Furnished in cut sizes or slabs. Meets A.A.S.H.O. Spec. M-33-49 (also 42 and 48), A.S.T.M. Spec. D-994-53-T, U. S. Navy Dept. 4-Y-D and 13-Y-C, and all State and Federal Specifications.

FIBRE EXPANSION JOINTS
SEALTIGHT Fibre Expansion Joints are resilient and non-extruding, composed of durable cane fibre uniformly impregnated with asphalt. Furnished in cut sizes or slabs. Meets A.A.S.H.O. Spec. M-59-49, A.A.S.H.O. Spec. 153-52 Type 3, Federal Spec. HHF-334 and HHF-341a Type 1 Class B, A.S.T.M. Spec. D544-49 Type 5, U. S. Navy Spec. 4-Y-D paragraph 1-10 part 2, and all State and Federal Specifications.

CORKFILL EXPANSION JOINTS
Similar in general construction to Asphalt Joints, they are made up of a shockproof mass of clean, granulated cork particles, uniformly combined with pure blown asphalt. They are ideal where low water absorption, resiliency and non-extruding properties are desirable. Especially adaptable for residential and industrial floor slab areas in termite infested territories.

SPONGE RUBBER EXPANSION JOINTS
A fully resilient, non-extruding joint composed of high quality blown sponge rubber of uniform thickness and density. Gray in color to blend with concrete . . . used wherever exposed joints in concrete must be inconspicuous. Ideal for floors, wall panels, bridges, viaducts, etc.

Write today for complete information on SEALTIGHT Expansion Joints and other top-quality SEALTIGHT products for better construction . . . ask for the "PAVING PRODUCTS" Catalog.

W. R. MEADOWS, INC.
13 KIMBALL ST. • ELGIN, ILLINOIS

For more facts, use Request Card at page 18 and circle No. 268

Roofing and painting in winter weather

An enclosure of 4×8-foot plywood form panels with a canvas top protects work on the built-up roof of the Guidance Operations Building at Warren Air Force Base, near Cheyenne, Wyo., during winter weather. The canvas ends are open for ventilation and to allow fumes to escape.

Wind, snow, and cold weather need not stop roofing and exterior painting operations. Doolittle Construction Co., Inc., Wichita, Kans., proved this by completing a $650,000 contract for guidance facilities at Missile Annex A of Francis E. Warren Air Force Base near Cheyenne, Wyo.

See these Distributors for a demonstration

ALABAMA
Joe Money Machinery Co., Inc.
Birmingham, Montgomery
COLORADO
Faris-Maritz Equipment Co.
Denver
FLORIDA
Finn Machinery Company
Miami
GEORGIA
Statham Machinery & Equipment Co.
Atlanta
ILLINOIS
George G. Anderson & Co., Inc.
Harvey
INDIANA
Korte Bros., Inc.
Fort Wayne, South Bend
KANSAS
Bublitz Machinery Company
Wichita
KENTUCKY
Wilson Machinery & Supply Co.
Lexington, Louisville, Owensboro
MICHIGAN
Champion, Inc.
Iron Mountain
Great Lakes Equipment Co.
Muskegon
J. R. Panelli Equipment Co., Inc.
Detroit
MISSISSIPPI
Aldridge-Harbour Equipment Co., Inc.
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MISSOURI
Bublitz Machinery Company
North Kansas City
MONTANA
Pioneer Equipment & Supply Co.
Butte
Yellowstone Machinery Co.
Sidney
NEVADA
General Equipment Company
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NEW JERSEY
Dale & Rankin, Inc.
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NEW YORK
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NORTH CAROLINA
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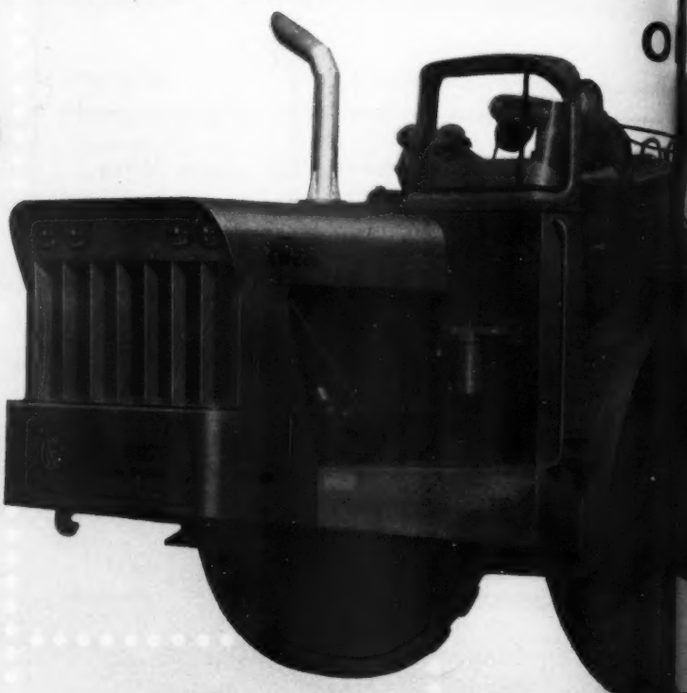
OHIO
Cantwell Machinery Company
Columbus
SOUTH CAROLINA
Carolina Equipment & Parts Co.
Columbia
TENNESSEE
San-Day Equipment Corp.
Knoxville
TEXAS
McCall-Gardner Machinery Co.
Houston
Richards Equipment Company
Waco
UTAH
Atlas Equipment Company
Salt Lake City
VIRGINIA
Capital Equipment Co., Inc.
Richmond, Roanoke
WEST VIRGINIA
Porter Supply Co., Inc.
Huntington
WYOMING
Century-White Truck Co., Inc.
Casper

MODEL CW-220
20.0 cu. yds. STRUCK
27.0 cu. yds. HEAPED
INTERCHANGEABLE WITH MODEL CWD-221 REAR DUMP UNIT

YARDS

MODEL CW-215
15.0 cu. yds. STRUCK
21.0 cu. yds. HEAPED
INTERCHANGEABLE WITH MODEL CWD-214 REAR DUMP UNIT



MODEL CW-27
7.0 cu. yds. STRUCK
10.0 cu. yds. HEAPED

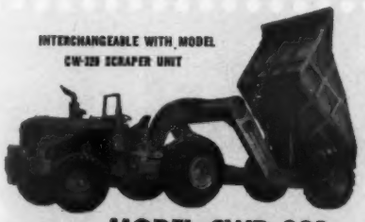
MODEL CW-320
20.0 cu. yds. STRUCK
27.0 cu. yds. HEAPED
INTERCHANGEABLE WITH MODEL CWD-221 REAR DUMP UNIT

MODEL CWD-221
21.0 cu. yds. STRUCK
31.0 cu. yds. HEAPED
35-TON LOAD CAPACITY
INTERCHANGEABLE WITH MODELS: CW-220

MODEL CW-22
26.0 cu. yds. STR
36.0 cu. yds. HEA

MODEL CWT-20
20.0 cu. yds. STRUCK
27.0 cu. yds. HEAPED

INTERCHANGEABLE WITH MODEL CW-220 SCRAPER UNIT



MODEL CWD-321
21.0 cu. yds. STRUCK
31.0 cu. yds. HEAPED
35-TON LOAD CAPACITY

CABLE CONTRO
for standard tractors
every horsepower

WINTER WORK

Panels 16×20 feet, of polyethylene plastic sheets fastened to 2×4's, are tied in place to protect paint and painters. The clear plastic lets daylight come through.

The principal item of this contract is the Guidance Operations Building, a single-story concrete-block masonry structure with prestressed double-tee concrete roof deck. The roof deck—lightweight concrete cover slab and built-up roofing—was placed during the winter. To complete the contract on schedule, the contractor also applied three coats of water-emulsion paint to the exterior of the building.

Keeping these operations going without lost time or extra expense took some careful planning on the part of project manager W. A. "Walt" Bastido. Walt, who has worked under winter conditions many times before, planned the work to take advantage of every possible day of good weather during the rugged Wyoming winter. Then he prepared enclosures of plywood, canvas, and polyethylene film to cover the work areas during bad weather, and brought in propane and oil-burning heaters to maintain suitable working temperatures.

The placing of the prestressed double-tee roof sections presented no special problems, but Bastido waited for a favorable weather forecast before attempting to place the 4 to 8-inch cover slab of lightweight concrete. When a weekend forecast indicated favorable weather, the crew worked right through the weekend to cast the complete deck. The concrete was immediately covered with tarpaulins, and big 500,000-btu propane burners inside the building provided plenty of heat to maintain suitable curing conditions.

Enclosure for roofers

For the roofing operation, the contractor built an enclosure that covered 3,500 square feet of the roof area at a time. The sides of the enclosure were 4×8-foot plywood form panels, and the canvas roof was supported on a framework of 2×4's and 2×8's. The canvas ends of the enclosure were usually open while the roofers were at work, to provide ventilation and permit the fumes of the hot roofing asphalt to escape.

Inside this enclosure, a Master

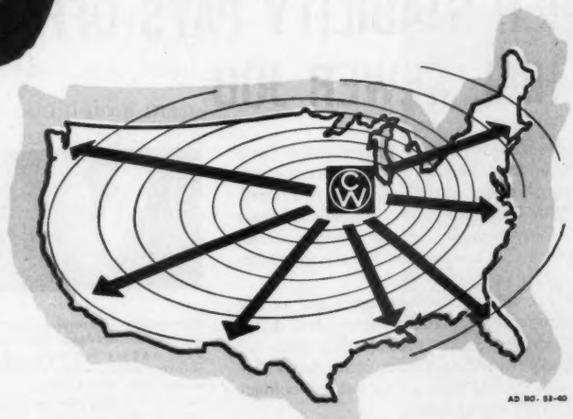
(*Continued on next page*)

This is one of the big 500,000-Btu propane-burning heaters that provide heat inside the building during construction. Roofers use the area near the heater to keep their roofing paper warm for easy handling.

AHEAD

ONY EARTHMOVING JOB ...The Curtiss-Wright Line

Let's skip the details and get down to basic facts about earthmovers. If you move more dirt, you make more money — it's as simple as that . . . and just about as easy, too, with the modern Curtiss-Wright line. C-W design features for high performance, easy operation and low maintenance put you yards ahead in production — dollars ahead in profit on any earthmoving job. Call your Curtiss-Wright distributor for complete information and specs on the machine performance matched to your job requirements.



AD NO. 52-40

...ur local Curtiss-Wright distrib-...r is part of a nationwide sales, ...ts and service network de-...oted to making Curtiss-Wright users ...e most satisfied in the industry. ...ou can depend on him for the most ...fficient, most cooperative serv-...e that it is possible to provide.

SOUTH BEND DIVISION, CURTISS-WRIGHT CORPORATION • SOUTH BEND, INDIANA

SOUTH BEND DIVISION
CURTISS-WRIGHT CORPORATION
SOUTH BEND, INDIANA

—For more facts, circle No. 269

Several fans are used to keep warm air circulating inside the building. They blow the warm air into the most remote corners of the structure so that a reasonably uniform temperature is maintained in all areas.

(Continued from preceding page)

Model 400 oil-burning heater kept the deck slab warm and provided comfortable working temperatures for the crews. The air circulated by this heater also helped to ventilate the enclosure and remove the fumes.

The enclosure was moved five times, each new position partially overlapping the previous one, so that the roof could be completed. It is interesting to note that the roofers lost no time in placing this roof, and the extra cost for winter protection was nominal.

Ordinarily, the painting of the exterior walls would have been left until spring, but the contract called for completion of the project by April 12. Since there was no assurance that the weather in early April would be any better than in January or February, Bastido built an enclosure to protect the paint and the painters and did the work in midwinter.

This enclosure was supported on a series of Safway tubular-steel scaffold bents that also supported the working platforms of the painters. Panels 16×20 feet were fabricated of 3×6 and covered with 6-mil polyethylene plastic sheets. These plastic sheets securely fastened to the frames, kept the strong and gusty winds from doing any damage. The panels were placed against the outside of the roof folding and tied in place.

The top and ends of the enclosure were made up of canvas tarpaulins placed over the scaffolding and weighted down with sand bags. The ends were usually left open while the workmen were painting to provide ventilation. A 150,000-Btu Master heater provided warmth inside the enclosure and aided ventilation. Ample light came through the plastic sheets.

Ordinarily, a section of wall 50 to 60 feet long was enclosed at a time. On consecutive days, the painters gave this area three successive coats of the water-emulsion paint. Another crew then quickly advanced the enclosure to a new area so that the painters could continue without loss of time. Portions of this same enclosure were used for the painting of several smaller buildings in the contract.

While these roofing and painting operations were going on outside, the several specialty subcontractors were completing mechanical, electrical, plastering, and other work inside the structure. Once the roof was on, a 500,000-Btu propane-burning circulating heater kept the interior of the building warm enough for these workmen.

This guidance facility is one small part of the project, which is establishing an Intercontinental Ballistic Missile base in the Cheyenne area for the Strategic Air Command. The construction is being done under the supervision of the Omaha District of the U. S. Army Corps of Engineers, with Col. S. T. Martin serving as area engineer in the Cheyenne area. Ray Fauss is resident engineer for the Corps at the Annex A location.

THE END

Besides the 1¾ yard ML-153 with its 6,000-pound carrying capacity, there's the rugged 2-yard ML-157 with 7,000-pound capacity.

LORAIN MOTO-LOADER STABILITY PAYS OFF ON A SIDE HILL SEWER JOB

This 1¾ yard, ML-153 Moto-Loader gets a real workout as it backfills along a sharply sloping bank. Working on a 6,000 foot sewer line, Easton Construction Company of Canonsburg, Pennsylvania, uses its husky Lorain Moto-Loader to fill trenches ranging from 5 to 12 feet in depth.

Handling heavy clay and rock . . . filling in and resloping steep banks call for real stability—Moto-Loader stability. Superior weight distribution and a low center of gravity eliminate bounce and teeter.

Maneuverability is in a class by itself too. Lorain's exclusive one-foot travel control and power booster steering let the operator put the Moto-Loader where he wants it in a hurry. This, plus finger-tip controls, means that one hand always remains on the steering wheel, while the other hand controls the bucket. Result: bigger payloads.

To this, add torque converter and power shift transmission, planetary four-wheel drive, four-wheel brakes, and special safety arms. All are part of Moto-Loader design for faster digging and loading cycles. For details, contact your Lorain distributor.

One-foot travel control. By pivoting his foot between two adjacent pedals the operator controls forward and reverse travel, plus acceleration. Both hands are always free for steering and other operations.

THE THEW SHOVEL COMPANY, LORAIN, OHIO

LORAIN®
ON THE MOVE

PLANTS in Lorain, Elyria and Bucyrus, Ohio.

PRODUCTS—Power shovels, cranes, draglines, clamshells, and hoes on crawler mountings from ⅜- to 2½-yard capacity • Cranes from 7 to 80 tons . . . on crawlers, and as rubber-tire Moto-Cranes, and Self-Propelled Cranes • Rubber tire front-end Moto-Loaders in 1¾- and 2-yard models.

OUTLETS—Lorain products sold and serviced by 249 distributor outlets throughout the world.

Goodrich donates plant

■ The city of Cadillac, Mich., has been presented with the plant property there of the B. F. Goodrich Co., Akron, Ohio. The $280,000 plant, containing 143,000 square feet of floor space on 13 acres of land, has been vacant since May, 1959.

Jesse M. Hawkins has been named New York district sales manager for B. F. Goodrich Industrial Products Co., a division of the parent firm. He succeeds the retired John M. Failey.

New Du Pont plant

■ The Engineering Department of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., will soon begin construction for a polyethylene resin plant at the firm's Victoria, Texas, Works. The plant, which is expected to be completed by early 1961, will create jobs for about 100 additional operating employees.

←For more facts, circle No. 270

The Huber-Warco 5D-190 blades down a fill on Wisconsin's new Hudson-Eau Claire Road.

Gerke gives **5D-190** a tough assignment

Lawrence Gerke, a contractor in Merrill, Wisconsin, chose the 5D-190 for the grading work on his Hudson-Eau Claire Road contract. The 5D-190 with a 195 h.p. diesel engine, torque converter and power shift transmission was just the ticket for this rugged terrain.

Over one million yards of dirt, and 300,000 yards of rock had to be moved. There were eight major cuts with the maximum 115 feet, and five major fills with the biggest being 70 ft.

The 5D-190's assignment . . . to build and maintain the haul roads, cut all the ditches, and work on the slopes after the cuts and fills were completed. The unit will also spread the granular sub-base and grade the top soil.

"We needed a grader that could do a man-sized job in keeping the haul roads clear and leveling off the fills," said Paul Potts, the grade foreman on the job. He continued, "That's a big order for one machine but the powerful 5D-190 is doing a good job. It's a very dependable grader and we're well pleased."

Let your Huber-Warco distributor show you what the features of the 5D-190 can mean to you on your jobs.

Huber-Warco on the job

There's one grader on the job handling all of the grading jobs, and it's the powerful, dependable Huber-Warco 5D-190.

Haul units move on schedule as the 5D-190 smooths out ruts and removes sharp rocks from the haul roads.

Huber-Warco Company

MARION, OHIO

For more facts, use Request Card at page 18 and circle No. 271

HUBER WARCO

TANDEM ROLLERS

MOTOR GRADERS

MAINTAINER

3 WHEEL ROLLERS

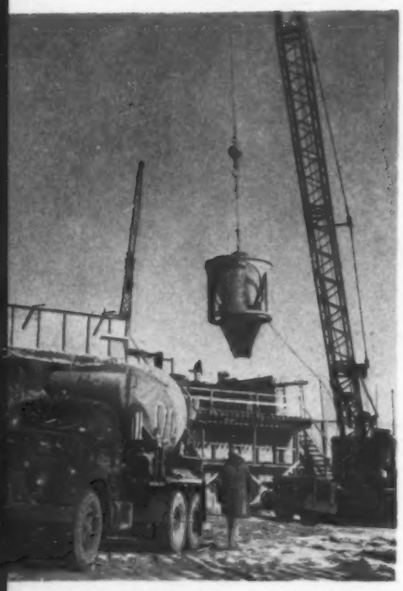
WINTER WORK

Winter concrete placeme

Winds up to 75 mph, temperatures down to 28 degrees below zero, and more than 60 inches of snowfall were some of the problems that plagued a contractor on a high-priority missile base. But George A. Fuller Co., Los Angeles, worked through the rugged Wyoming winter to build the first squadron launching facilities for Atlas Intercontinental Ballistic Missiles near Francis E. Warren Air Force Base, Cheyenne.

Located on a high plateau—some 7,000 feet above sea level—23 miles northwest of Cheyenne, the site is exposed to the full brunt of the winter storms that sweep out of the northwest. Occasional storms would have been bad enough, but at this high location the wind seems to blow at gale force every day, and temperatures range between 10 and 25 degrees even on the good winter days.

The $12 million contract for the six launchers, plus support facilities and utilities, was scheduled for completion in 390 calendar days. There was no alternative but to carry on the work through the winter at the maximum speed. Actually, there were



Concrete work on the Atlas launching facilities near the Francis E. Warren AFB, Cheyenne, Wyo., has to continue through the winter to meet the construction schedule. A Lorain Moto-Crane with 70-foot boom and 30-foot jib is placing concrete. The protective housing is made of 4×8-foot sheets of plywood on 2×4 frames.

The protective covering is opened to expose the top of the wall form as a Gar-Bro 1-yard bucket is swung into position for placement.

A Michigan 125A tractor shovel feeds sand and gravel into the receiving hopper of the concrete plant.

—— Make a "spec check"...

Compare Haulpak*... see ho

LW engineers "threw away the book" when they designed the new Haulpak off-road hauler... for *your* benefit. Some of the exclusive features that resulted are shown here. They are advantages that help you move *more* tonnage, *faster*, at *lower* net cost per ton.

To see what this advanced design approach means to Haulpak, check its specifications. You'll want "spec sheets" in your files anyway, and your LW Distributor can supply you copies. Then, with basic Haulpak facts handy, compare them to *other* off-road haulers.

WHAT YOU WILL FIND WHEN YOU COMPARE HAULPAK:

(Competitive hauler specifications are "averaged out" for simplicity purposes... but Haulpak superiority is just as clear over any *single* machine.)

WHAT TO COMPARE	Off-road Haulers 20-30-ton class		Off-road Haulers 30-40-ton class		HOW YOU BENEFIT
	Average*	Haulpak LW 27	Average*	Haulpak LW 32	
Length Wheelbase Turn Diameter	26'7" 14'4" 64'3"	23'10" 10'10" 44' 6"	31'5" 16'7" 77'6"	23'10" 10'10" 44' 6"	*HAULPAK is shorter.* You maneuver faster, quicker and in less space.
Top Speed (in mph)	30.7	35.4	25.2	38.8	*HAULPAK is faster,* for more cycles per hour, more tonnage per shift.
Empty Weight (in lb)	49,300	43,020	73,400	44,950	*HAULPAK is lighter,* for more payload weight, less "dead" weight.
Ground Clearance Front Axle Rear Axle	16" 16"	25" 20"	17¼" 18½"	25" 20"	*HAULPAK has higher clearance,* to minimize troublesome "dozing" action.
Brake Surface (sq inches)	1511	4680	1834	5148	*HAULPAK has bigger brakes,* for greater safety, more steady use of high speeds.

(*Based on specifications available at time of printing)

mpletes ICBM base on time

Contractor works through rugged Wyoming winter; winds, cold, and snow plague the project

very few days during the entire winter when concrete was not being placed, and other work was also in progress on those days.

Accommodates missile squadron

Construction at this site includes the complete launching and service facilities for one SAC missile squadron. Living quarters for the men are provided at Warren AFB in Cheyenne. The launching facilities include six launch and service buildings (from which the missiles are launched), two launch operations buildings (the blockhouses), a water pumping station, waste-water channels, seven miles of road in the project area, water and electrical distribution systems, and a sewerage system. Guidance facilities are being built under a separate contract. (See "Roofing and Painting in Winter Weather," page 30.) All of this work is being done under the direction of the Omaha District of the U. S. Army Corps of Engineers.

The largest structures in Fuller's contract are the reinforced-concrete launch and service buildings, which measure roughly 104×133 feet. They extend about two stories above ground, with footings and flame deflectors penetrating well below ground. A 120×26-foot steel trestle extends out from one end of the launcher to carry a mobile roof fitted with snow-melting panels. This roof covers the missile when it is lying flat in the storage position. It rolls back onto the trestle when the missile is to be raised to the firing position.

The 2-story operations buildings have heavily reinforced roofs and are backfilled to roof level with an earth fill on 3 to 1 slopes all around. The launching crews are in these buildings at the time missiles are fired.

Getting the work under way late in August, Fuller and the earthwork subcontractor, Bramley Construction Co., Denver, concentrated their efforts on the excavations for the structures and the work on the roads and underground utilities. The building excavations were substantially completed before extreme cold or frozen ground became a handicap, and enough of the roads had been built to provide access to the work areas.

Build protective enclosures

Knowing that concrete placement must continue throughout the winter, the contractor made suitable provisions to fight the cold. Work, carried on simultaneously on three of the launchers, was protected with enclosures of plywood, canvas, and Visqueen clear plastic film.

While the basic reinforced-concrete frame of each launcher was being built, almost the entire structure was enclosed in a housing. Then, after the concrete had been placed and cured, portions of the enclosures were removed and re-used on other structures. Openings in the concrete walls were then closed with temporary doors or with coverings of Visqueen so that work could continue inside.

The exterior walls of the enclo-

The Noble Mobile plant supplying the concrete for the job is enclosed to conserve heat and to protect workmen from the cold and wind. The covered inclined belt, at right, carries batches to the transit mixers.

All new . . . but Haulpak is already a fully-proven piece of equipment. Units worked for over 14 months on construction jobs, in mines, and in quarries, before the first Haulpak was put on the market. Exceptional results of these tests are now being duplicated all around the nation.

can cut your haul costs

Hydrair* suspension...eliminates springs...permits higher clearance, shorter turns

Haulpak rides on air! 4 Hydrair units replace steel springs. System cushions against loading and travel shock, reduces maintenance costs. Eliminates front axle, and compensates for off-center load. *COMPARE IT!*

"V"-shaped body...lets Haulpak outcarry trucks that are longer, higher, heavier

Bonus yardage in every Haulpak load rides in exclusive V-bottom of body. Slope also helps fill all corners for low-void payloads. "V" lowers center of gravity for better stability, traction, on grades. *COMPARE IT!*

Box-beam frame...3 times stronger, ⅓ lighter, carries 30% more payload weight

Strongest hauler body ever built. Floor and all wear-surfaces made of 10,000 psi steel, yet weighs 33% less than comparable bodies. Body is exhaust-heated. Haulpak hauls 30% more than its own total weight. *COMPARE IT!*

Available in 22, 27, and 32-ton capacities

...MINIMUM MAINTENANCE (entire lube-check, needed only at ...r intervals, consists of just 4 easy-to-reach grease fittings) . . . ...WER-TRANSFER DIFFERENTIAL (famed Tournapull® feature which ...matically transfers power to wheel on best footing when going is ...) . . . POWER-MISER FAN (cools with 20 to 25 less hp drain) . . . 100% RUBBER-MOUNTED BODY (absorbs impact and shock of loading) . . . FOUR SEPARATE BRAKING SYSTEMS (for fast stops with complete safety) . . . POSITIVE POWER STEER (for faster turning, easier handling) . . . SIMPLE SIX-GEAR FINAL DRIVE (compared to 12 or more usually standard) . . . BIG, ROOMY CAB (has many work-efficiency features).

*Trademark HP-2193-DC-2

LW

Where quality is a habit

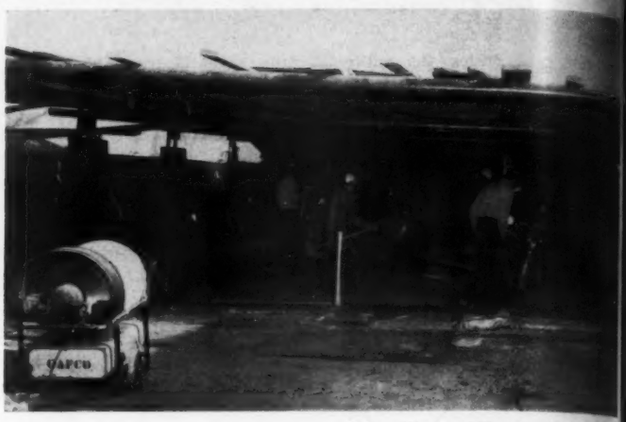
LETOURNEAU-WESTINGHOUSE COMPANY

PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

For more facts, use Request Card at page 18 and circle No. 272

A portion of a water tank is enclosed with canvas on 2×4 frames. Workmen are bringing sections of Symons Steel-Ply form panels out of the enclosure. Note that the fill pipe for water trucks is wrapped with insulating material.



Using Wacker Vibro-Rammers and an Essick roller, a crew shapes and compacts the subgrade for a concrete floor slab under an enclosure of pipe stringers, plank, and canvas. The Master oil-burning heater has been kept in operation to draw all frost out of the ground. A window of polyethylene clear film, left, admits daylight.

(Continued from preceding page)

sures were generally built of ¼-inch plywood sheets backed with 2×4 frames around the edges. These were quickly and easily assembled and could be stacked on top of each other for the high enclosures. The roofs of the protective housings were usually of canvas or Visqueen on 2×4 frames. Where the roof was to be removed for concrete placement, canvas was used. Where light was desired inside the enclosure, the frames were covered with 6-mil clear Visqueen plastic sheets. This material kept out the wind and snow, held in the heat, and admitted enough daylight so that men could work without artificial light.

The frequent gusty winds that reached near-hurricane velocities frequently damaged the canvas and Visqueen coverings. These high winds made it necessary to tie down the enclosures on the inside and guy them down from the outside.

Heat inside the enclosures was provided by steam boilers and unit heaters, and by Master oil-burning heaters. Two Bryan 30-hp stationary steam boilers were set up in temporary buildings conveniently located between the launchers. The steam was piped to each launcher site and to the operations buildings where unit heaters were installed in the areas to be heated.

Additional heat for areas where it was not practical to bring steam was supplied by 30 Master oil-burning heaters. Twenty of these were the Model 125 with 100,000-Btu ratings. The other ten were the larger Model 600, rated at 500,000 Btu.

Inside the warm enclosures, workmen erected the wall forms, using Symons Steel-Ply form panels. The bottoms and slabs were formed with plywood and lumber and shored with Symons steel and wood adjustable shores. Each of the launchers required 80,000 square feet of forms, and each operations building for an additional 30,000 square

7 TO 16 FEET VARIANCE IN DEPTH, YET . . .

a perfect curve on a tough trench job with lightweight steel piling

This job called for shoring trenches on 40-foot diameters; since each one ranged in depth from 7 to 16 feet, aligning the sections accurately posed a problem. Foster Lightweight Steel-Sheet Piling, with its exclusive "non-jam" interlock, solved the problem by eliminating the need to thread one section the entire length of the adjacent section.

The Foster steel sheeting, light enough to be easily handled, was set on line manually against a special platform guide, then driven two feet to stand by itself. With all the sheeting in place the platform was removed and the piling driven to required depth. Every piece drove straight and true, even though some was driven 18 feet into hard bottom.

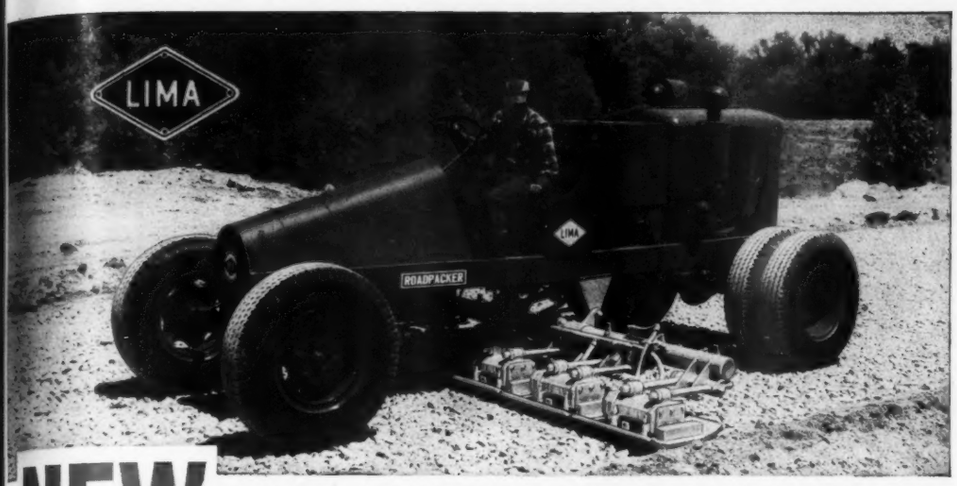
Foster Lightweight Piling, pound-for-pound stronger than any other lightweight piling, costs less to buy, less to use. Economy and versatility make it ideal for many light-load excavations including cofferdams, trenches, shore and pier protection, docks, and other piling applications.

COMPLETE PILING SERVICE "FASTER from FOSTER"
Rental Steel-Sheet Piling • Pipe Piles • H-Bearing Pile Hammers • Extractors • Rail and Track Accessories • Pipe

See Sweet's Industrial Construction and Plant Engineering Files, or write for Catalog CE-10.

L. B. FOSTER CO.
PITTSBURGH • NEW YORK • CHICAGO
HOUSTON • LOS ANGELES • ATLANTA

For more facts, use Request Card at page 18 and circle No. 273



NEW LIMA ROADPACKER MODEL D

Compacts Fast, Wide and Deep on Macadam, Gravel, Crushed Rock, Sand, Soil Cement and Stabilized Bases

SAVE WITH SINGLE COURSE CONSTRUCTION

Lima Roadpackers meet the challenge—no other vibratory compactor gives you so many cost-saving job-speeding features . . . the reason why Lima Roadpackers are preferred by contractors throughout the world for fast production on highway and airport construction jobs.

Compare these profit-making features!

Heavy Vibrators

Six 437 pound vibrators deliver earth-shaking vibrations for deep, uniform densities. Vibrator units are completely sealed—no external moving parts. Vibrators are self-lubricated and need no daily maintenance. Required densities are quickly achieved. Macadam rock is tightly keyed, with screenings vibrated into voids in only three applications on most jobs. Compacts up to 600 tons per hour.

Infinite Speeds

20 feet per minute to 30 miles per hour! A fluid motor propels the machine while compacting. A dial selector gives compaction speeds to match any job including new high production requirements within a broad range of 20 to 95 feet per minute. Roadpacker can be anywhere on the job at a moments notice. Heavy duty transmission provides fast highway travel speeds to next job.

One Lever Instant Reversing

Compacts forward or reverse with one lever control—no gear shifts—no declutching—no stopping. With the Lima Roadpacker you have no lost time and no depression in the material being compacted when machine is reversed.

Variable Working Widths

End shoes fold back for a selection of 4, 5 or 6 shoe working widths. Easily folded by the operator alone, the Roadpacker carries unused shoes ready for wider working widths at any time. Folded end shoes permit Roadpacker to travel over highway.

Controls Up Front

Roadpacker controls are all grouped at operator's seat—engine gages and controls are mounted on dash panel. Foot accelerator in addition to hand throttle provides natural roading of Roadpacker.

Widener Attachment

Extension arm works shoes in a widening trench to 11" below the existing pavement. Quickly adapted to various width widening work; replaces trench rollers.

These are only a few of the advantages incorporated into the new rugged Lima Roadpacker, Model D. For complete information, see your nearby Lima distributor, or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA Construction Equipment Division, Lima, Ohio

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5948

Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment

BALDWIN BLH LIMA-HAMILTON

For more facts, use Request Card at page 18 and circle No. 274

Contractor on new Ohio Freeway speeds tough project

GULF MAKES THINGS

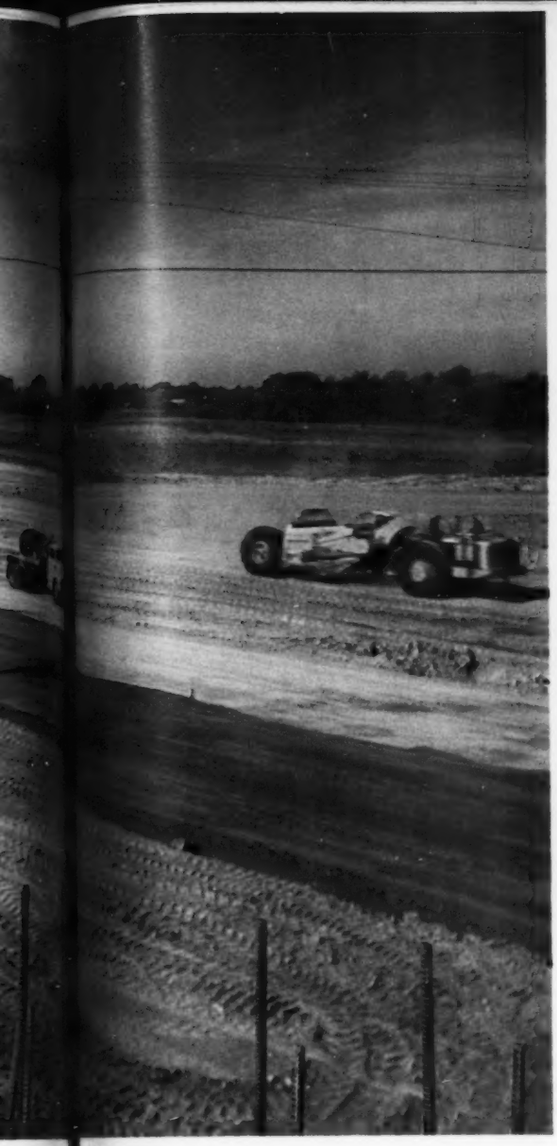
Take it from Bruns Coal Company, highway contractor of Zanesville, Ohio—Gulf makes things run better when the going's tough. Especially for their hard-working graders, scrapers, dozers, trucks.

Their contract calls for clearing, grading, drainage, paving, landscaping and bridge-building—on a 6-mile section of the new Ohio Freeway which will link Cincinnati and Conneaut, Ohio.

They're moving over 2,000,000 cubic yards of earth in the process . . . building two and one-quarter mile ramps and interchanges . . . pouring over 129,000 sq yards of 10″ reinforced concrete pavement.

To keep things rolling, on a tight schedule, h operates all their heavy-duty powered equipment clean-burning Gulf fuels . . . lubricates them with c working Gulf oils and greases . . . and relies on Gul on-the-job service and prompt delivery.

Bruns has plenty of proof that Gulf makes thing



On the job servicing with Gulf oils and greases is a regular routine between two 10-hour shifts, six days a week, for Bruns Coal Company on their Ohio Freeway contract.

Gulf man on the job checks fuel and lube requirements with Bruns executives. Left to right: Dennis Garwood, Chief Engineer; Lloyd Bruns, Vice President and Project Superintendent; Carl Bortles, Survey Chief; Frank Shindeldecker, General Superintendent; and William Stranko, Gulf Sales Representative.

Bruns Coal Company is the prime contractor on Project No. 37 of the Conneaut-Cincinnati Thruway. Bruns relies on Gulf fuels and lubricants to keep equipment rolling at top efficiency on this $5,000,000 job.

...ulf fuels, lubricants and service . . .

G$RUN BETTER!

better. Their engines run clean with maximum power output. Their equipment stays on the job with a minimum of mechanical delays. Maintenance costs are held down. And they're on schedule.

How about your equipment efficiency? See how Gulf makes things run better. Just call a Gulf Sales Representative at the nearest Gulf office. Meanwhile, mail coupon for the latest edition of "Gulf Contractors' Guide"—the maintenance "bible" for heavy equipment.

GULF

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Dept. DM, Gulf Bldg., Pittsburgh 30, Pa.

Please send me the free "Contractors' Guide"

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Company_____
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City_____ Zone____ State_____

GP-9930

KOHLER ENGINES

4-cycle Short-stroke Air-cooled

MODEL
K91

MODEL
K331

- **Conservatively rated, reliable. Kohler Co. has manufactured internal combustion engines for 38 years.**
- **Short stroke gives more usable power—cuts engine friction.**
- **Hot spark assures quick starting in all weather.**
- **Balanced crankshaft—ball bearings at both ends.**
- **Cylinder and crankcase are made of metallurgically controlled close grained cylinder iron.**
- **Mechanical governor for accurate RPM control.**
- **Rugged construction—plenty of lugging power.**

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Enameled Iron and Vitreous China Plumbing Fixtures • Brass Fittings • Electric Plants • Air-cooled Engines • Precision Controls

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Most of the earthwork was done before winter set in, but backfilling was a rough job during the cold months. The Brodall is placing material around the foundation of one of the launchers. Note the chunks of frozen dirt in the foreground.

Compaction of semifrozen dirt around footings of launchers took a lot of effort. The Allis-Chalmers HD-5 Tracto-Shovel pulling a Tampo vibrating roller is following another HD-5 with Vibro-Plus Terrapac vibrating roller. ►

Roller had a total of 74,000 square feet of the Symons form panels on the job, and they were kept in constant use. In erecting some of the high wall and beam forms, the crews worked from Adjustomatic scaffolding, which also provided temporary support for the forms. When the shoring and bracing were in place, the scaffolding was removed and reused in other areas.

Concrete placement

The 28,000 cubic yards of concrete for the project was produced on the site under a subcontract by Western Concrete, Inc., Denver. Western set up a Noble Mobile semiautomatic batch plant to dry-batch the cement and aggregates to a fleet of five 7-yard Jaeger transit mixers carried on Mack trucks.

Water for the mix was heated to 155 degrees by a steam boiler, but the dry ingredients were not heated. The lower areas of the plant were enclosed to protect the workmen and prevent loss of fines to the high winds. The conveyor taking the batches from the weigh bucket to the transit mixers was closely covered for the same reason.

Aggregates were delivered by truck and stockpiled at the plant. A Michigan 125A tractor shovel fed the sand

(Continued on next page)

Pair of Master Model 125 oil-burning heaters operate between Symons steel forms and an enclosure of clear polyethylene plastic sheets on lumber frames. A temperature of at least 50 degrees was maintained for the 7-day curing period.

Two LW graders serve fleet of 56 trucks

When Peel Construction Co., Brampton, Ontario, rebuilt an 8-mi. section of Ontario Hwy. 25 recently, two of its 14 LeTourneau-Westinghouse graders got a *real* workout. And the job they turned in is further proof that it pays to use *quality-built* graders in your earthmoving operations.

Grader No. 1...a 123-hp LW Adams* 550 model...was assigned the job of maintaining haul-routes for a big fleet of eight-ton dump-trucks hauling gravel base to the new roadway. Even though as many as 56 trucks were in use at one time, moving heavy loads, the LW grader kept approaches dry, drained, hard, and smooth, permitting high-speed travel to 50 mph.

Grader No. 2...another LW 550...was given an even tougher assignment. As the sand and gravel from the trucks was dumped and spread, the grader followed through to blade off the material, smooth it out, and shape the shoulders and ditch slopes. *All this while normal traffic of automobiles and trucks continued without interruption.*

With an average of 5,000 tons a day of new material dumped on the roadway, this one LW grader kept well ahead on this important assignment.

"Can't be matched"

"Of all the graders this company has owned," according to one company official, "none can beat the LW's. These machines do everything we ask of them. They stand up well under tough work conditions."

See for yourself the work that a heavy-duty LW Adams grader can handle. Ask your distributor to demonstrate the models best suited for your particular need. The big 190-hp and 145-hp models are equipped with torque converters. There are five other models, ranging from 60 to 160 hp. A size to fit every job and every budget.

"It's got good visibility...I can see what I'm doing, coming and going," says John McIntyre, operator for Peel Construction Company. Here he spreads gravel with an Adams 550 on a repaving job, where 56 trucks were kept busy hauling in roadbuilding materials.

*Trademark G-2049-DCJ-1

LW

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

For more facts, use Request Card at page 18 and circle No. 277

(Continued from preceding page)

and gravel to a hopper, and a belt carried them to the plant bins. Cement was received by truck transport and elevated directly into the plant storage silo.

Two Lorain 35-ton Moto-Cranes, each using two 1-yard Gar-Bro buckets, took the concrete from the transit mixers and hoisted it to the forms. The workmen opened the canvas roof covers just enough to permit concrete to be placed and vibrated. Then the covers were replaced, and a temperature of at least 50 degrees F was maintained inside the enclosure for a 7-day curing period. Exposed surfaces were sprayed with Hunt Process curing compound.

Although most of the necessary earthwork was done in the fall with spreads of C and D Tournapulls, there were some excavation and a considerable amount of backfilling to be done during the winter. Where frost had to be ripped, Bramley used a Caterpillar D8 equipped with dozer and ripper. Excavation around the buildings was handled by a Gradall.

Placing and compacting backfill was one of the most troublesome winter jobs. Material without frost chunks was brought in by the D Tournapulls or by trucks and spread by Allis-Chalmers HD-5 tractor-dozers. Open areas were then compacted by Tampo and Vibro-Plus vibrating rollers towed by HD-5 tractors. Areas close to walls or that could not be reached by rollers were tamped by gasoline-powered Wacker tampers.

The backfilling of utility trenches presented similar problems. Here the contractor used an International TD-14 Drott Skid-Shovel to place shallow lifts of unfrozen material in the trenches. Compaction was accomplished with the use of a small one-man Essick vibrating roller.

Personnel

A crew of about 300 men worked through the winter to keep the project on schedule. As weather became more favorable in the spring, the crew was augmented until it reached a peak of about 600 men. Completion is scheduled for this month.

The supervisory staff for George A. Fuller Co. is headed by project manager Frank McGarvey, project superintendent Ed J. Marn, project engineer Carl Wilcox, and assistant superintendent James Shaw. Area superintendents in charge of the separate structures were Charles E. Rayner, Fred Strauss, John E. Moore, and Gene Anstey.

Supervision of the project for the Omaha District of the Corps of Engineers is handled through the Cheyenne area office under area engineer Col. S. T. Martin and assistant area engineer Joe Patterson. The resident engineer on the project is Ray Fauss, who is assisted by Maurice Garber and Bill Bieg.

Col. D. G. Hammond is district engineer of the Omaha District. Plans and specifications for the project were prepared by Holmes & Narver, Inc., Los Angeles. THE END

Talcott forms subsidiary; names vice presidents

■ James Talcott, Inc., New York City, has formed a new industrial time-sales subsidiary, James Talcott Southern, Inc., at 1424 Healey Bldg., Atlanta, Ga. The firm will specialize in the financing of installment sales of income-producing machinery to manufacturers and distributors in the Southeast.

Eugene Carroll and John Hart have been named operating vice presidents of the subsidiary. The parent company's Atlanta representatives, Clarence Knowles and Roy Glascoe, will have headquarters in the new office and will continue to offer the parent company's commercial financing and factoring services to industrial firms in the area.

Husco licenses firm to make, sell products

■ Hydraulic Unit Specialties Co., Waukesha, Wis., has licensed Rubery, Owen & Co., Ltd., Darlaston, England, for the world-wide manufacture and sale of Husco products. The British engineering firm is the head of a group of subsidiary and associated British companies that comprise the Owen Organization.

The license agreement excludes the U. S. and Canadian markets but gives the British firm the right to make and sell duplicates of Husco's hydraulic products according to confidential drawings, specifications, know-how, and technical data from Husco.

Installment plan to aid buyers of PM equipment

■ A new installment sales plan to increase the sales of road-building, construction, mining, and logging equipment produced by Pettibone Mulliken Corp., Chicago, offers extended terms to industrial purchasers. The plan will be administered by James Talcott, Inc., New York City financing firm.

Iowa Mfg. assigns

■ A new member of the sales staff of Iowa Mfg. Co., Cedar Rapids, Iowa, is Joseph R. Black, who will act as a special representative for the Cedarapids line of bituminous mixing and paving equipment.

ONLY RAMSET has the exclusive RED TIP fastener with guaranteed performance

Red Tip fasteners—over 100 threaded studs, drive pins and eye pins—are made to do a *better* fastening job into concrete or steel. Produced from top-quality steel and austempered for extra strength, these fasteners are your best buy for efficient, trouble-free powder-actuated fastening.

Ramset Red Tip fasteners are guaranteed on every approved application! Under Ramset's unique "100-for-100" guarantee, you pay only for the number of fasteners called for on your plans. Insist on the Red Tip fastener . . . call your Ramset dealer today for details—he's listed under "Tools" in the Yellow Pages!

Red Tip serves as guide in barrel of tool, and indicates proper penetration.

In addition to powder-actuated fastening, the versatile Ramset System includes Shure-Set® hammer-in tools for light fastening, and Ringblaster® heavy-duty kiln gun.

Ramset® Fastening System

WINCHESTER-WESTERN DIV. • OLIN MATHIESON CHEMICAL CORPORATION
283-J WINCHESTER AVENUE • NEW HAVEN 4, CONNECTICUT

For more facts, use Request Card at page 18 and circle No. 278

• Because they're designed and engineered for specific tasks, you'll find MADESCO blocks with heavy steel shells and fittings, your *safest* choice. In materials and in construction too, MADESCO tackle blocks assure the extra service that comes from over thirty years of specialized experience and "know-how."

MADESCO sheaves (of iron or steel) are correctly grooved to prolong rope-life. Loads travel smoothly, easily, quickly to save lifting time; savings too come from minimized maintenance and down-time.

• There's a complete line of MADESCO tackle blocks for every need. Consult your distributor or write for our engineering recommendations.

MADESCO TACKLE BLOCK CO.
Main Office, Easton, Pa.

MADESCO BLOCKS

MAE—MAD 621/259

For more facts, circle No. 279

Interstate grading in off season makes contractors face challenge of . . .

Moving dirt at 5 below

Working downhill to get more pull, a D8 pulls a LeTourneau-Westinghouse ripper to open frozen ground for grading work on U. S. 12 near Battle Creek, Mich. W. J. Muehlenbeck, Saginaw, Mich., handled the clay at 31 cents a yard.

WINTER WORK

Dirt moving in sub-zero weather demands special techniques. Two contractors worked out methods suiting their jobs as they pitted their men and equipment against the elements and graded a stretch of interstate highway near Battle Creek, Mich. Although both outfits worked on one general contract, each was faced with different problems.

W. J. Muehlenbeck of Saginaw, Mich, was working in clay with mile-long hauls between cuts and fills. The other contractor, Maclean Construction Co., Lansing, Mich., was working in sand with short hauls of about 2,000 feet.

Snow and cold

It was good weather for winter sports but not the season for earthmoving. Both outfits worked in temperatures down to five below. Frost in the unbroken ground went down 2 and 3 feet. Heavy snow blanketed the right-of-way.

In spite of the difficult conditions, both outfits kept producing through the winter. How did they do it?

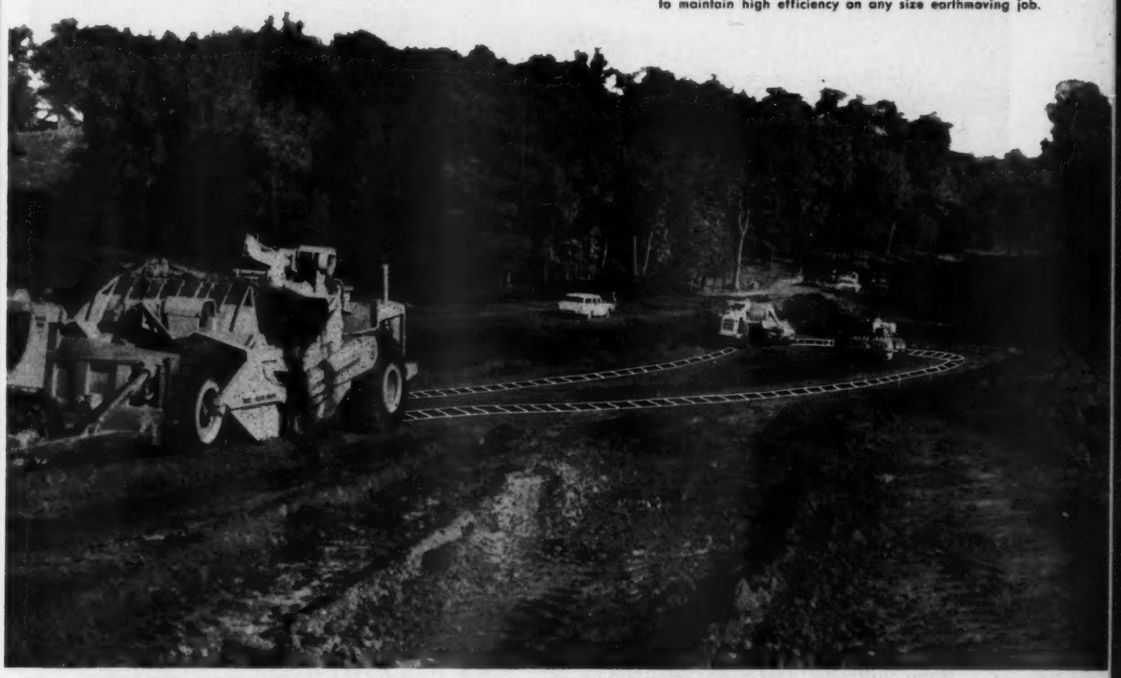
In the first place, the two superintendents held the theory that their men could keep warm by working hard, rather than by sitting around drinking hot coffee. Both men and supers went out in the cold and went to work. They ripped the heavy layer of frost, pushed the frozen chunks out of the way with dozers, and loaded the frost-free material with high-powered scrapers.

The contractors worked their equipment on deep cuts and high fills

(Continued on next page)

Track and rubber-tire tractor-dozers are used by Muehlenbeck to spread the material. The wheels of the LeTourneau-Westinghouse C Tournatractor and the tracks of the D6 also provided the necessary compaction.

Two of Welch Construction's 3 C 'Pulls work one of the many short-haul sections on the 8.1-mile Hennepin County, Minn., road project. Tournapulls' easy-loading scraper, short-turn radius, fingertip electric controls, and power-transfer differential are some of the features that combine to maintain high efficiency on any size earthmoving job.



Are 18-yd self-propelled scrapers profitable on short-haul work?

2½-minute cycles enable Welch Construction Company to say "yes!"

Many dirtmovers think of big, speedy self-propelled scrapers as strictly medium-to-long-haul tools. This may be true for some machines, but experience tells the Earl Welch Construction Company, Minneapolis, that using LeTourneau-Westinghouse C Tournapulls® with easy-loading 18-yd Fullpak® scrapers can be profitable on short as well as long hauls.

A good example of C 'Pull's excellent production-ability on short hauls was demonstrated when Welch Construction rebuilt 8.1 miles of Hennepin County Road 24, near Hamel, Minn. Here, the firm used 3 C Fullpaks to move 376,000 yd of earth, most of it over short hauls averaging 600'. The 'Pulls' performance: 1290' cycles averaged 2½ min. Payloads for push-loaded 'Pulls* averaged 13 yd per unit. Net result: job completed ahead of schedule.

The same time-saving features that make Welch's C 'Pulls profitable on long-haul work paid off on this short-haul job, too. Says Owner Earl Welch, "It's 'Pull's short turns, maneuverability, and ability to get in and out of soft areas fast that does it. What's more, maintenance costs are much less."

Many contractors are finding that LW C 'Pulls have the capacity, speed, and maneuverability to make them profitable in any scraper dirt, on any length haul. The "C" is available with 270-hp V-Power, 20-yd capacity, or 226 hp, 18 yd. Next time you contemplate buying a scraper, inquire about the LW Model C.

*Trademark CP-2079-DCJ-1

LW

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

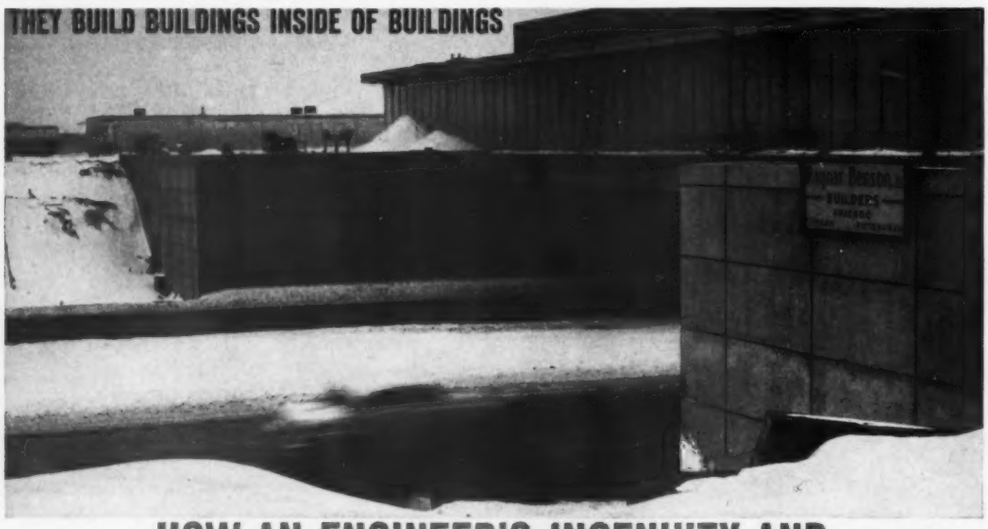
Where quality is a habit

For more facts, use Request Card at page 18 and circle No. 280

Short hauls and work in sand that does not freeze makes the work of Maclean Construction Co., Lansing, easier than that of the Muehlenbeck firm. This Cat D9 pushes a DW21 scraper in a cut area on the Maclean stretch. Most of the rigs in the spread were enclosed.

A Cat DW21 drops a load that is leveled out by a LeTourneau-Westinghouse Model C Tournatractor on the Maclean job. An Austin-Western grader also works on the fill.

Clearing snow from access roads to the Maclean project is a job for this Austin-Western 99L motor grader to handle.



HOW AN ENGINEER'S INGENUITY AND VISQUEEN TRADE MARK FILM'S SUPERIOR TOUGHNESS AND ECONOMY PAID OFF ON SUPER HIGHWAY PROJECT

Bone-chilling winter winds whipped at six job sites on the new super highway system around Chicago. Ragnar Benson Construction Company was building a series of service stations and unique highway-spanning restaurants.

"Despite the cold winds, crews worked in comfort at peak efficiency"—says project manager Bob Conway who built his buildings *inside of buildings of VISQUEEN film!*

"I'm amazed at the performance of VISQUEEN film," says Conway. "It stands up under unusually tough punishment. On the restaurant jobs, for example, when big semi-trucks highball through, there is terrific air pressure backlash. It sounds like firecrackers exploding when the film snaps back. But not one rip or tear in VISQUEEN film."

"VISQUEEN film is much more economical than canvas or other films, too. The initial cost is so low we can use new film for every job. This cuts down considerably on our handling costs," Conway reports.

He says: "I like VISQUEEN film's superior strength and toughness. It is more uniform in thickness than other polyethylene. It has better light transmission. No extra lighting is needed. The natural heat of the sun gets in, too. It costs us much less to heat an enclosure of VISQUEEN film than it does to heat a canvas enclosure."

"VISQUEEN" FILM IS SPECIALLY FORMULATED FOR THE NEEDS OF CONTRACTORS AND BUILDERS. Stronger, tougher because it is made to quality standards of VISKING COMPANY—pioneer polyethylene producers. *Seamless* widths, custom rolls and folds for greater economy and ease of handling in meeting your every need.

WRITE FOR COMPLETE INFORMATION

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Division of UNION CARBIDE *Corporation*

6733 West 65th Street, Chicago 38, Illinois Dept. CO10
In Canada: VISKING COMPANY DIVISION OF UNION CARBIDE CANADA LIMITED, Lindsay, Ontario.
VISQUEEN, VISKING and UNION CARBIDE are registered trademarks of Union Carbide Corporation.

For more facts, use Request Card at page 18 and circle No. 281

(Continued from preceding page)

so that the area exposed to cold air was kept at a minimum. Maintaining haul roads was no problem. The frozen ground stayed as hard as concrete and required little maintenance. Most of the operators were protected from the weather by enclosed cabs.

Dirt is subcontracted

The two grading outfits subcontracted the work from L. A. Davidson, Lansing, Mich., which held the $3.8 million contract for a 6.8-mile section of relocated U.S. 12 south of Battle Creek. Davidson worked through the winter to complete most of the work on the structures. (See page 74.) The 4-lane divided highway is a part of the interstate route between Detroit and Chicago.

Maclean has better half

From the standpoint of winter work, Maclean Construction Co. got the more desirable half of the 2.7 million cubic yards of dirt on the general contract. Most of the material was sand, located in an interchange area about a mile square on the east end of the job. The sand was bought for about 28 cents a yard.

Since sand holds relatively little moisture, it does not freeze solid like clay or other high plastic materials. Once the frost in a layer of topsoil has been ripped through, the sandy material below seldom freezes up.

The high fills of the interchange area also gave the contractor another advantage. Since the material was spread in short, but high, sections, a minimum of the dirt was exposed to the cold air.

Good production

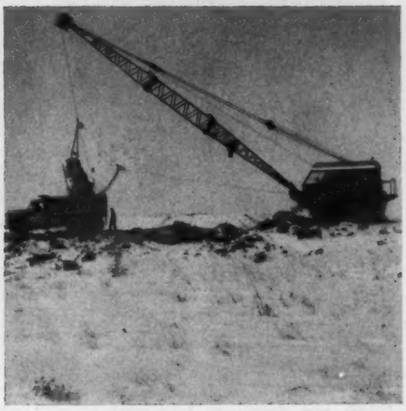
According to Kenneth Maclean, superintendent on the job, "Moving dirt profitably in the winter is possible only if you pick the right kind of job. High fills, deep cuts, and granulated material is the best kind of earthmoving job in cold weather.

"In this material, we're making about as good production as we would in the summer. With our five Cat DW21's we're moving about 4,000 cubic yards in an 8½-hour day. Hauls are less than half a mile.

"Of course, it's harder to get

Moisture rising from uncovered and relatively warm clay condenses in the morning air as one of Muehlenbeck's TD-24's starts pushing aside material that had frozen during the night.

One of Muehlenbeck's Euclid TS-24 twin-engine scrapers, working without the help of a push-dozer, unloads material for an access ramp to the highway.



On some of the long hauls on the Muehlenbeck contract, a truck and dragline operation was used. The Lima 703 is using a 2-yard bucket to load the Chevrolet dump truck.

around in the winter, and we have to rip most of the new ground with our D9. Actually, I'd say that winter work costs us only the use of an extra dozer on the job."

As a result of having cabs on all of the equipment, Maclean did not lose any time. Not even snow storms caused a shutdown.

Equipment

In the cuts, the five DW21's were push-loaded by one of the two Cat D9's on the job. On the fills, a LeTourneau-Westinghouse Tournatractor spread the material. With its extra speed, the rubber-tire dozer had no trouble keeping up with the five scrapers. Compaction was gained by the wheels of the equipment operating on the fill.

An Austin-Western 99L motor grader kept on the prowl, maintaining haul roads and clearing snow from access roads.

Muehlenbeck has tough work

In contrast to Maclean's work was the tough winter job Muehlenbeck had to do. Its 1.3 million yards was spread over a 5½-mile length of the highway. Most of the material was clay and, with its high moisture content, it froze solid in a fairly short time. It was more expensive dirt, going for about 31 cents a yard.

To open up the cuts, it was generally necessary to rip through the 1 to 2 feet of frost. A LeTourneau-Westinghouse single-hook ripper, pulled by a Caterpillar D8 and pushed by an International TD-24 dozer, handled the work.

Two pushers cut loading time

Once the frozen chunks of clay were pushed out of the way, the frost-free material was loaded by the fleet of five Euclid TS-24 twin-engine scrapers.

Two International TD-24's in tandem pushed the scrapers to cut the loading time to about 25 seconds. The extra dozer cut about 10 to 15 seconds off the loading time.

The top layer of material in the cut often froze over during the night. The next morning, the tractor-dozers broke up the frost and pushed the frozen chunks to one side.

(Continued on next page)

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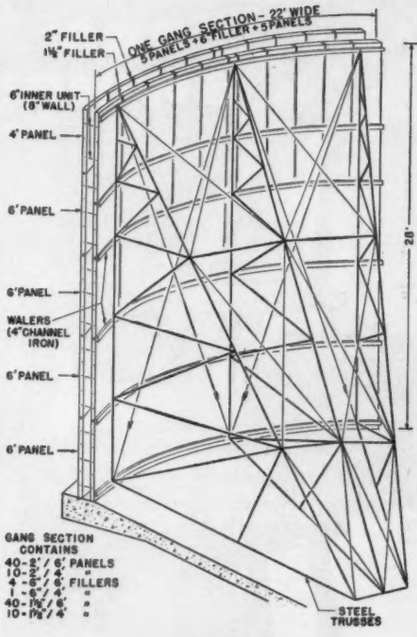
New use for Symons Steel-Plys in gang forming . . .

28′ CIRCULAR WALLS GANGED FOR SEWAGE PLANT


2" FILLER
1¼" FILLER
ONE GANG SECTION – 22' WIDE
5 PANELS + 2 FILLER + 5 PANELS
6" INNER UNIT (8" WALL)
4' PANEL
6' PANEL
6' PANEL
WALERS (4" CHANNEL IRON)
6' PANEL
6' PANEL
28'
GANG SECTION CONTAINS
40 - 2' / 6' PANELS
10 - 2' / 4' "
4 - 6" / 6' FILLERS
1 - 6" / 4' "
40 - 1¼" / 6' "
10 - 1¼" / 4' "
STEEL TRUSSES

2,300 square feet of forms on inside ganged section stripped and reset by crane in 3½ hours.

8 men in less than 8 hours erected 2,300 square feet of forms and scaffolding on outside plus pouring the concrete.

Friebel & Hartman, Shelby, Ohio contractor ganged Symons Steel-Ply Forms on the Mansfield, Ohio Sewage Treatment Plant. The project consisted of four digestors, each 80 feet in diameter and 28 feet in height and 8 inches thick with no horizontal joints.

4 Ton Sections

Four ganged sections were used—each 22 feet wide and 28 feet high. This allowed pouring ⅛ of a tank at a time. Each ganged unit consisted of four rows of 6′ Symons Forms and one row of 4′ forms to make the 28′ height. Three trusses were used to brace each ganged section. A ¾ yard Lorain with an 80′ boom handled the sections.

One Pour Every 4 Working Days

What is the Friebel & Hartman verdict on using this method of pouring: "Ganged forming enabled us to place our concrete efficiently and vibrate properly, held bracing costs to a minimum, allowed us one pour every four working days and gave us some very low erection costs."

Complete story on the Ohio Sewage Treatment Plant will be sent FREE upon request. Symons Forms may be rented with purchase option.

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(Continued from preceding page)

A Galion motor grader brings the roadway to final grade along the stretch handled by Muehlenbeck. The grader also maintained haul roads, though the frozen condition of the roads made this a minor item of work.

Normally, the material that froze during the night on the fill area was not removed. It was broken up by the equipment operating on the fill and then covered over with the frost-free dirt from the cut. In an effort to help the grading meet the schedule, the Highway Department allowed some fills to be started on natural ground that had frozen. The settlement is expected to be slight, however, and to occur before the pavement is placed.

Rubber-tire dozer on fill

Like Maclean, Muehlenbeck was also sold on the idea of working a fast rubber-tire dozer on the fill. It, too, used a LeTourneau-Westinghouse Tournatractor to spread the material. This piece of equipment was sometimes supplemented with a Cat D6 tractor-dozer.

The hauls were long, averaging about ¾ mile. Because of the frozen ground, the haul roads required little maintenance. Still, the contractor kept a Galion and a Huber-Warco grader busy doing the necessary maintenance, finish grading, and snow clearing.

On a 2-mile haul (one-way), the five TS-24's were able to move about 6,000 yards in a 9-hour day. A complete cycle ran at about 12 minutes.

According to superintendent Howard Schaitburger, the winter job of moving clay was rough. "I'd say that our over-all production is 25 per cent off what it would be with the same equipment in the summer. In the winter, the extra time is spent ripping, fighting the weather, and clearing away the snow. It's slower going all the way.

"Still, we've got to eat. We can't afford to go to Florida for the winter. So we stick around here and give it hell."

Personnel

The project engineer in charge of grading for the State Highway Department is Jim Johnson. Ross LaVanway is the project engineer for the structures. For W. J. Muehlenbeck, Howard Schaitburger is general superintendent. Kenneth Maclean supervises the field work for Maclean Construction Co.

THE END

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SILENT HOIST & CRANE CO.
BROOKLYN 20, N. Y.

For more facts, circle No. 366

EXCAVATION THROUGH MORE THAN 30 INCHES OF FROST and pavement is being done for a $4 million sanitary-sewer project in Millcreek Township near Erie, Pa. C. L. Herman of Erie, one of 12 contractors on the job, uses a Lorain hoe for the job of digging pipe trenches 10 to 24 feet deep and 40 to 45 inches wide.

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Euclid service school in San Francisco area

A series of courses on preventive maintenance, trouble shooting, and repair of major components used on Euclid earthmoving equipment is being offered by the service training department of the Euclid Division, General Motors Corp., Cleveland. The school will be held at the GMC training center at 1444 First Ave., San Leandro, Calif., and is open to all Euclid owners, operators, and service personnel from the San Francisco area.

There will be three separate courses, each covering a different type of Euclid equipment. The opening session, which runs from November 16 through 20, will be on the TS-24 scraper. The second course, from November 30 through December 4, will cover the Allison Torqmatic transmissions CRT-5830, CLBT-5640, and CT-3340. The third, from December 7 to 18, will be on C-6 and TC-12 crawler tractors.

Detailed information on the sessions can be obtained from local Euclid dealers, who will also assist in obtaining transportation and accommodation information.

Ford directory lists its truck dealers in U. S.

The Ford Division, Ford Motor Co., Dearborn, Mich., has issued a new directory listing all Ford heavy-duty truck dealers throughout the nation. The 27-page book offers operators a complete and ready reference for both sales and immediate service on all Ford heavy-duty trucks.

Also listed are the address and telephone number of each of the division's 35 district sales offices.

The directory is available through all Ford heavy-duty truck dealers.

Yale & Towne divisions make personnel changes

J. J. Curry has been named midwest regional sales manager by Yale Materials Handling Division, The Yale & Towne Mfg. Co., Philadelphia. He will supervise and coordinate activities of Yale factory sales and service branches and franchised representatives in the states of Michigan, Ohio, Indiana, and Kentucky.

Edwards G. Stanhope is the new hoisting-equipment district manager for New England. From Wellesley Hills, Mass., headquarters, Stanhope will supervise sales and service activities of Yale's network of industrial distributors in Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, and parts of Connecticut.

Two appointments have been made in the field sales organization of the Trojan Division, Batavia, N. Y. R. J. Lyons, Jr., is tractor-shovel district representative in New Jersey, Pennsylvania, Maryland, Virginia, West Virginia, Kentucky, Ohio, and southern New York State.

Robert C. Peterson will serve in a similar capacity in Montana, Wyoming, Idaho, Utah, Colorado, New Mexico, Arizona, and the province of Saskatchewan in Canada.

APPROACH WORK for the Conneaut Creek Bridge on the Cincinnati-Conneaut Ohio Freeway involves a fill 70 feet deep and extending 1,000 feet on each side of the bridge. Dirt dumped by the scrapers is leveled off by the Huber-Warco 5D-190 motor grader and compacted by a sheepsfoot roller. The Bruns Coal Co., Zanesville, Ohio, has the contract for all the dirt work on this 6-mile section.

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Greatest Value...in Performance...Service...Price

Looked at from any angle—performance, service, price—the new "LD" (Low battery Drain) 2-Way Radio is sensational news from the leader. Minimum tubes in the receiver, no vibrators in the power supply—they've been replaced by readily available stock transistors for long life and dependability! Transistors used only in circuits where long experience has proven they can give reliable performance. Your RCA representative will be glad to show you why the "LD"—dollar for dollar, feature for feature—is today's greatest 2-way radio value.

Heat drain reduces internal temperature of unit up to 40%, providing longer component life (case has wrap-around heat sink). Standby monitoring feature cuts battery drain to a mere 2¼ amps. With vehicle engine off, radio can be left on to receive incoming messages for long periods without impairing battery life—automotive cabling used exclusively for greater flexibility, positive contact, corrosion resistance. Five watts of audio power for greatest message intelligibility. Equipment easily moved from car-to-car—trunk or true-dash mount. Security sealed circuits clearly numbered to provide "road map" for fast, simple servicing—RCA Service Company technicians available to keep your equipment operating at maximum efficiency.

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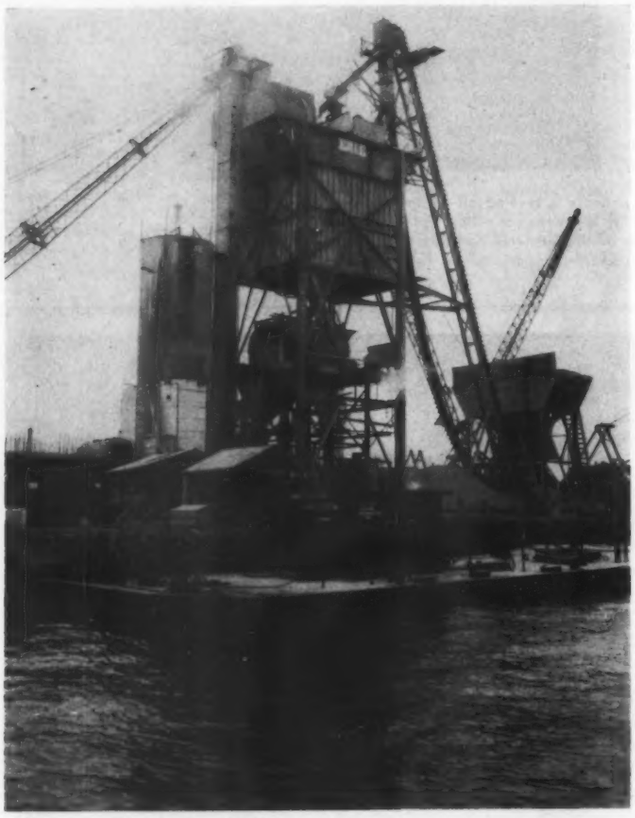
WINTER WORK

Caisson sinking operations for Throgs Neck Bridge go on through critical 6-week winter period as . . .

Heating plant keeps concrete work on time



The contractor-built heating plant next to the cement silo of the Erie-Strayer batch plant keeps work operative on the caisson of the Queens anchorage of the Throgs Neck Bridge from January 12 through February 20. Cells were excavated from this date until April when concrete work could be resumed without the need for the heating plant.

For six weeks at the peak of winter, concrete placing continued for the caisson of the Queens anchorage of the Throgs Neck Bridge in New York City. A contractor-built heating plant made concrete operations possible during this time and kept the job to its tight schedule.

J. Rich Steers, Inc., and Frederick Snare Corp., the New York City firms engaged in a joint venture on the $10,600,000 Queens anchorage of the bridge between the Bronx and Queens, began work in March, 1958. During the summer of that year, concrete placing began for the 146×226-foot caisson. Steers-Snare alternated the sinking and concrete-placing operations, which were handled by four Manitowoc 3900 cranes and a Clyde stiffleg derrick located on the cofferdam cells. This procedure continued until November 21, when the last concrete was placed. The cranes and derrick then replaced their concrete buckets with clamshells to begin excavating the caisson through the seventy-seven 16-foot-diameter digging wells.

Excavation continued, and the caisson slowly sank into the river bottom. During this digging period—from November 21 to January 12 of this year—Steers-Snare designed and built a heating plant and installed it into the unused concrete batch plant. This allowed the contractor to place concrete during the next 6-week period ending February 20. Digging operations were then resumed and continued until April, when the mean temperature was above freezing and the heating plant was no longer needed.

Heating plant

The heating plant consisted of a 300-hp boiler, a heat exchanger, a 1,000-gallon fuel tank, and piping.

The 20-foot-high, 6-foot-10-inch-diameter boiler — equipped with a W. N. Best burner and a 30-foot stack — was positioned next to the cement silo of the batch plant. This boiler supplied live steam directly to each of the aggregate-bin compartments, as well as to a contractor-built heat exchanger. Steam at a pressure of over 40 psi was used to atomize the No. 2 diesel fuel at the

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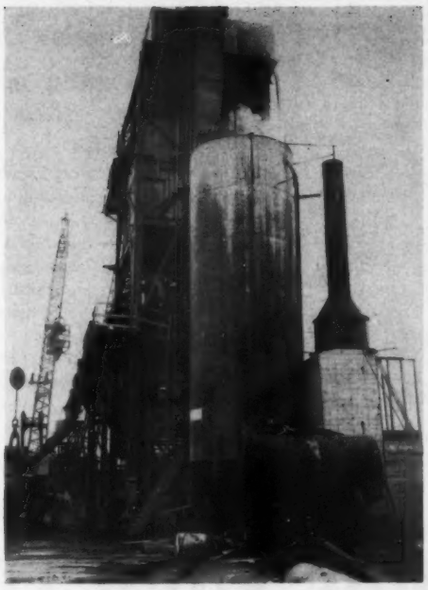
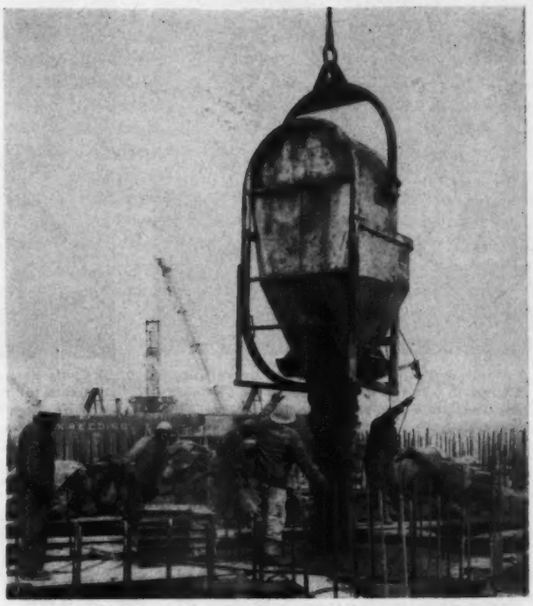


The heart of the plant is this 300-hp boiler, 20 feet high and 6 feet 10 inches in diameter, with a 30-foot stack. The horizontal tank holds 1,000 gallons of diesel fuel, which is fed by gravity to the burner beneath the boiler. The boiler feeds live steam into each aggregate-bin compartment and into a contractor-built heat exchanger installed in the water line.



Heated aggregates and water raised to a temperature of 100 degrees F produce a concrete that has a temperature of about 50 degrees as it is dropped from the Gar-Bro 3-yard bucket. The men, heavily clad, are working in one of the coldest months of the year.

burner. Before the 40-psi steam pressure was reached, the burner fuel was atomized by compresed air supplied by two Ingersoll-Rand 600-cfm rotary compressors.

Steam leaving the vertical boiler passed through a 2-inch-diameter line, which was tapped by four ½-inch-diameter branches. One branch supplied steam to the bin compartments; one fed steam to the aggregate hopper; one ran to the heat exchanger; and the fourth to the water tank.

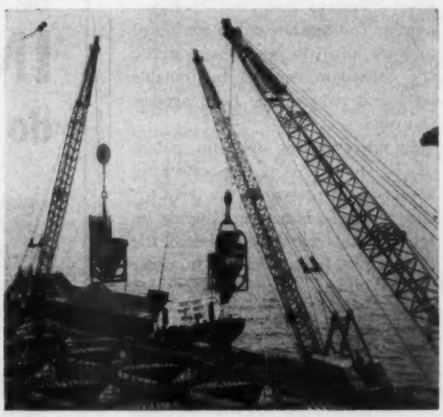
The contractor-built heat exchanger was installed in the water line. As water passed through the steam coils, its temperature was raised to 100 degrees F. This, plus the heated aggregates, produced a concrete mix having a temperature of about 50 degrees F at the forms.

A heating-coil setup was also installed in the water tank for use in case of a slowdown in batching operations and also to prevent freezing whenever the plant was shut down. In another precautionary step, Steers-Snare maintained a 65,000-gallon water barge at the plant, to supply water in case of a drop in pressure in the city water system. The contractor ran an underwater line from a city main on shore to the batch plant on the cofferdam.

Cofferdam pumped

Before the caisson excavation began, Marlow 10-inch and Griffin 8-inch pumps were used to lower the water level inside the cofferdam to about minus 10 feet. Then the Griffin wellpoint pump was installed in the system to draw the water down to elevation minus 17 feet. Four Manitowoc cranes and the Clyde derrick then dug until the top of the caisson

(Continued on next page)



Three Manitowoc 3900 cranes handle concrete buckets to reach a corner of the caisson that cannot be served by the derrick. Buckets have to be passed to the rear crane, which handles concrete placement.

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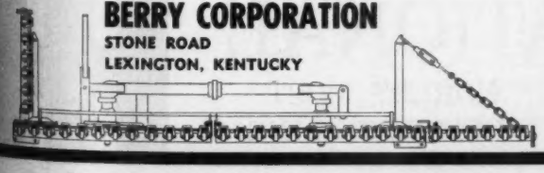

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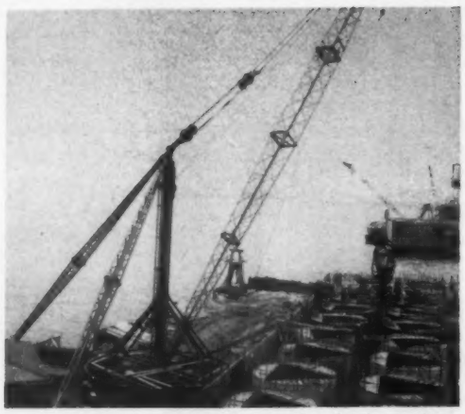
A Manitowoc with Insley 1½-yard bucket places concrete in a corner inaccessible to the Clyde derrick. The crane is working on top of the cofferdam cells.



A Clyde derrick uses a modified laydown bucket to place concrete for the caisson. Cantilevered forms, foreground, are insulated to prevent the heat of hydration from escaping from the new concrete.

Goodyear builds new tire plant in France

■ A 75-acre site in Amiens, 80 miles north of Paris, has been selected for a new tire and tube manufacturing plant in France for Goodyear Tire & Rubber Co., Akron, Ohio. The $7 million plant is being designed in France and, with the exception of specialized tire-making facilities, all machinery will be purchased in that country. Passenger, truck, and farm tires will be made there for France, the common European market, and export.

James A. Goodson will head the firm's operations in France as managing director. Production director of the new plant will be W. T. Clayton; chief engineer, E. J. Weller; and personnel manager, Jack L. Woodliff.

(Continued from preceding page)

was sunk to elevation minus 12 feet, when the digging stopped.

After concrete placement built up the caisson to above minus 5 feet, a second Marlow 10-inch pump brought water back into the cofferdam. The wellpoint pump, located at about minus 5 feet, was then removed. The Marlow pump continued to work until the water level inside the cofferdam equaled the outside level and reduced the head against the cells.

By operating the wellpoint system during the filling of the cofferdam, Steers-Snare prevented the head inside the cofferdam from building up too fast. This was done to control the flow under the cofferdam in order not to disturb anything that could possibly cause damage to the cofferdam cells.

Caisson digging wells were formed with Blaw-Knox steel forms supported on the previous lift by three steel base lugs. After 12 hours, the forms were collapsed, pulled up through the wells, and repositioned. The freshly placed concrete was covered with burlap bags filled with salt hay to retain the heat of hydration during the winter days. The outside cantilevered steel forms, forming the vertical surfaces of the caisson, were insulated with 1-inch-thick material having a K factor of 37. Burlap bags were left in place for about three to four days, when the caisson was ready for the next lift.

With these precautions and devices, Steers-Snare encountered no problems with concrete placement during the rugged 6-week period.

The Steers personnel on the project includes Earl Larson, project manager, and Frank McGahan, project engineer. The job is under the direction of John Malcolm, general superintendent, and Eugene Rau, vice president and chief engineer for J. Rich Steers, Inc.

Amman & Whitney, New York City, the consulting engineering firm for the Triboro Bridge and Tunnel Authority, has William Delahanty as resident engineer for the entire Throgs Neck Bridge project and Stanley Johnson as project engineer on the Steers-Snare job. THE END

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International Harvester Co., Chicago • Motor Trucks • Crawler Tractors • Construction Equipment • McCormick® Farm Equipment and Farmall® Tractors

Corps develops welder furnishing ac, dc power

■ A new welding machine to make thin-gage materials easier to weld has been developed by the U. S. Army Engineer Research and Development Laboratories, Fort Belvoir, Va. The shielded inert-gas arc welder furnishes both ac and dc power for metallic arc or tungsten inert-gas welding. It also provides dc for metal inert-gas welding and consumable electrode process welding by attaching any wire feeders and consumable wire guns. This includes push or pull and water or air-cooled type of guns up to 300 amp.

Other features of the welder are 1-kw, 115-volt dc auxiliary power while welding; 10-kw, 115/230-volt ac single-phase, 60-cycle power; built-in high-frequency stabilizer that can be used continuously or for start only; automatic inert-gas control with solenoid valve and post-flow timer; and a 3-position selector switch to provide ac welding or the choice of either straight or reverse polarity dc welding. The unit also contains a built-in and concealed 20-gallon-capacity coolant system with electric pump to supply cooling liquid for welding as required.

The generator is comprised of an engine-driven revolving field, single-phase alternating current with 115-volt dc excitation provided by a directly coupled exciter. The welding power is fed through the necessary controls and a heavy-duty semi-metallic rectifier to provide dc current.

The unit's over-all dimensions are: 59¼ inches long, 25½ inches wide, and 41¼ inches high. It is mounted on a ¼-ton military trailer chassis, also developed by the Laboratories. The complete unit weighs approximately 2,100 pounds.

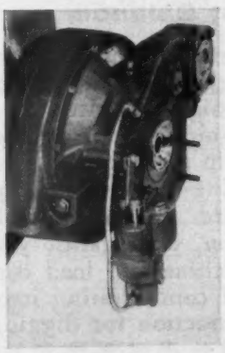
The welder has yet to undergo Signal Corps radio suppression tests. It is currently being used by Engineer and Ordnance units supporting the Redstone missile program.

Dependable! From reinforced cabs to extra-husky frames, V-8 powered INTERNATIONAL six-wheel trucks are quality built for fast-moving dependability. Rugged power trains including up to 549 cu. in. V-8 engines and standard differential lock-out are factory matched for heavy-duty use. Special truck pistons and rings cut oil consumption. Metered-flow water jacket evens engine temperature. Finish-honed replaceable exhaust valve guides and self-aligning hydraulic tappets further reduce nominal downtime. COE and conventional models to 65,000 lbs. GCW.

ght! Rugged, six-wheel INTERNATIONAL transit-mix chassis available with six-cylinder ine options offering up to cu. in. displacement. Every und-foot of engine torque is ltiplied by an over-all gear duction of over 100-to-1. The werful result is dependable, ooth-working tandem performance that keeps heavy-duty loads moving on schedule—t cost with reduced operating ense and downtime. 34,000 tandems, 15,000 lb. front es. Optional power steering sel engines to 175 hp.

Now increase payloads and working life with direct drive flywheel power take-off!

New INTERNATIONAL factory mounted option on heavy-duty "six" or V-8 engines eliminate power take-off at front end. Direct gear drive off flywheel gives you up to 75 hp. at output shaft. There are no belts to replace, no excessive parts to wear out . . . maintenance and downtime are kept to minimum.



For more facts, use Request Card at page 18 and circle No. 289

American Pulley promotes six in reorganization

■ In a reorganization program for its production and engineer functions, The American Pulley Co., Philadelphia, has named Charles E. Bain general works manager in complete charge of engineering and manufacturing.

Also promoted are W. L. Leonard to chief engineer of power transmission equipment and W. S. Nichols to chief engineer of material-handling and pressed-metals specialties. H. W. Leadbeater is now shop superintendent responsible for all shop operations. T. M. Keating, as production manager, has responsibility for control of production and inventory, and J. T. Richards has become chief industrial engineer in charge of tool design, methods, and time study.

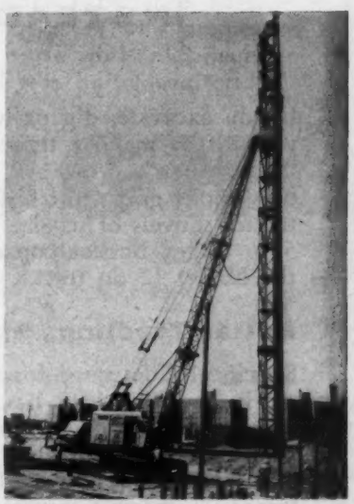
Black & Decker creates public-relations post

■ John F. Apsey, Jr., has been named to the newly created post of director of public relations for The Black & Decker Mfg. Co., Towson, Md. Apsey will organize and implement a broad program of publicity and communications.

G. Harvey Porter succeeds Apsey in his former post of advertising manager. Porter will plan the general promotional activities of the electric-tool manufacturer, coordinating the work of the advertising, literature, and sales promotion departments and the company's advertising agency.

Esso Standard elects

■ Robert O. Goodykoontz, general manager of marketing, and J. Prince Warner, general manager of manufacturing, have been elected vice presidents of Esso Standard Oil Co., New York, N. Y.



PILES 80 FEET LONG are being driven for a New York City Housing Authority $15 million 24-apartment project in Far Rockaway, Queens. The P&H crane, supporting an Ingersoll-Rand 600-cfm compressor on a rear platform, is using a Vulcan No. 1 hammer in 110-foot leads to drive the 8-inch-diameter Armco pipe piles. A pipe sleeve was used whenever splicing was necessary.

BEATS ALL COMPETITION

A COMPLETE, UNIT-DESIGN TRACTOR-SHOVEL INSTEAD OF A TRACTOR ATTACHMENT

If you excavate, dig or load materials, you owe it to yourself to make a thorough study of the model 12 "PAYLOADER". This 1¾ yd. crawler type shovel not only looks good, but has out-performed conventional tractor-shovels of its size . . . and even machines with 50% larger bucket capacities. There's nothing like the Model 12 on tracks.

Better Traction, Stability, Balance

Specifically designed for shovel jobs and not drawbar work, the Model 12 has the engine mounted in the rear. This factor alone makes a big difference . . . it counter-balances loading forces imposed during digging and the weight of the load in the bucket during travel . . . permits greater dumping reach with heaping loads without tipping forward. In shovel work, rear-engine design works *for you,* not against you. It spreads the weight of the machine and load over the entire track length instead of concentrating it on the front idlers. Result — more traction for digging, more stability for faster carry, smoother riding, less track maintenance . . . *plus* the ability to work in soft spots where other machines would bog down.

Power Steering Without Foot Brakes

Here is another operator's dream incorporated into the Model 12 — no heavy foot brakes to be pushed day-in and day-out. This "PAYLOADER" has two hydraulically-powered hand-steering levers, one for each track, that give the operator unexcelled maneuverability with finger-tip ease, enable him to make gradual or pivot turns as needed. The most modern non-stop, power-shift transmission provides low speeds for digging power as well as high forward and reverse travel speeds. There's no master clutch on the Model 12, no stopping for range shifts . . . all shifts, up or down, are made with only one finger-tip control lever, instantly, on the go. A heavy-duty torque converter automatically balances engine power to the load and provides an infinite number of travel speeds.

For more facts, use coupon on facing page or Request Card at page 18 and circle No. 290

Loads trucks almost twice as fast

"It has cut truck-loading time nearly in half over our other tractor-loader," says Anthony Oliver, operator for Mohawk Constructors, Inc., Linden, N.J. "There is just nothing to compare with ease of operation and operator comfort offered by the Model 12. I also find the bucket control very accurate for grading work.

Backs out without spilling

Says Marvin Meier, operator for S. F. Renaud, Denver, Colo., "These Model 12's are the fastest basement diggers you can get. They dig easier and come out of the hole backwards or forwards without spilling. Besides, they are so easy to handle, you can't even find other equipment you can compare with them."

Outperformed two popular makes

"You can move forward or reverse with just a flick of the wrist. There's better visibility to cut basements and I can cut within an inch all the way around," says Eddie Campbell, contractor of Dyer, Indiana. Campbell dug 36 x 40 x 5 basements in 3½ hours, through 12 to 15 inches of frost. The Model 12 outperformed two other popular makes and was not only faster, but sturdier in his opinion.

Cuts basement digging time 1/3

"We first tried the Model 12 digging basements side by side with a ———— of equal size. The Model 12 finished its hole ⅓ quicker," says D. L. Johnson of Pearson Construction Company, Joliet, Ill. His operator, with 18 years tractor-shovel experience, says, "Its ease of operation, smoother ride and greater vision sold me. I can do the same work in 5 hours that it took me 8 before, and with half the effort."

Visibility... Comfort... Service Ease

The Model 12 operator is comfortably seated forward of the engine where nothing obstructs his vision. He can see what his bucket is doing and where he is going at all times. This central location gives him a smoother ride, because he is not subjected to the flipping action of the rear-seated position on conventional tractors. For fast, easy service and maintenance, the hydraulic boom arm control (no hoist needed) raises the rear superstructure of the Model 12 to provide easy access to steering clutches, lower chassis assembly, engine, transmission and other inspection points.

Get the complete story of the Model 12 "PAYLOADER", and why its many operating advantages make all other tractor-shovels obsolete. Its remarkable "built-in" traction, stability and balance is fully explained in an attractive 8-page bulletin that is yours for the asking.

HOUGH®

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LIBERTYVILLE, ILLINOIS
SUBSIDIARY — INTERNATIONAL HARVESTER COMPANY

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THE FRANK G. HOUGH CO.
762 Sunnyside Ave., Libertyville, Ill.

Please send more data on the Model 12 "PAYLOADER"

Name _____

Title _____

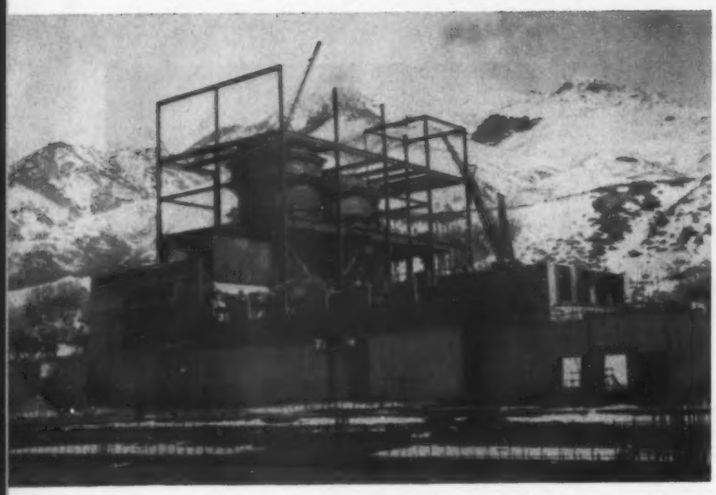
Company _____

Street _____

City _____ State _____

10-C-1

For more facts, use coupon or Request Card at page 18 and circle No. 290



WINTER WORK

Filtration plant project keeps going through winter

Work on exposed tanks for the filtration plant for Salt Lake City, Utah, was done as long as good weather held; with the onset of winter, crews switched to work on the chemical and administration buildings. Cranes are placing concrete for the chemical building while masonry work is in progress. As sections were enclosed, they were heated.

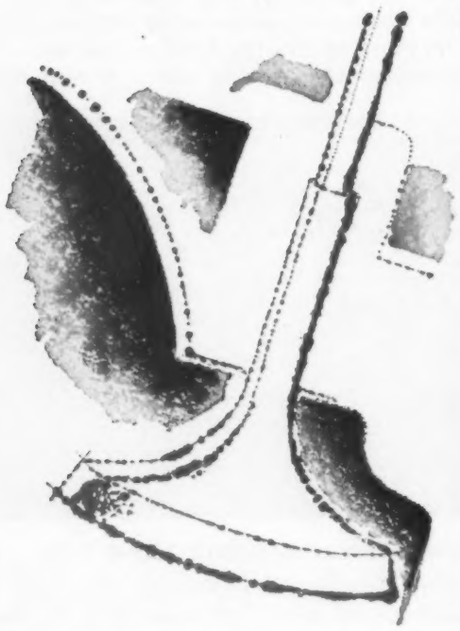
Some canvas covers, a few heaters, a little warm water and a lot of careful planning combined to keep work in progress throughout the winter at the new $6.8 million filtration plant being built by Davis & Butler Construction Co., Salt Lake City, for the Salt Lake City Metropolitan Water District. The plant is located at the mouth of Little Cottonwood Canyon at the foot of the Wasatch Mountains, a few miles southeast of Utah's capital city.

While winters in this area are not too severe, the contractor had to think and move fast to maintain progress when snows blanketed the site and succeeding thaws transformed much of the area into mud. Davis & Butler spread out its crew and pushed work on the big exposed tanks while good weather held out in the fall. Then, as winter closed in, they concentrated all manpower on the two multistory structures, the chemical and administration buildings. Work areas in these structures were protected with a minimum of canvas enclosure and a few heaters while many operations, such as steelwork and masonry, continued outdoors whenever weather permitted.

Plant is compact

The 100-mgd water-treatment plant will be one of the largest and most modern in the country. Designed by John A. Carollo, consulting engineering firm of Phoenix, Ariz., the

The few round columns required on the project were formed with Sonotubes. Floor, ceiling, and beam forms were shored with Waco adjustable steel shores.



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Oil...
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Valves which open and close hundreds of times a minute can cause lost money, time and power when deposits and wear start to take their toll. Sinclair Tenol® Oils fight deposits and wear—help keep vital parts working longer without repair. Refill with Tenol now. Next time management asks how you've cut costs, tell them you've switched to Sinclair—and show them the results.

Call your Sinclair Representative for further information or write for free literature to Sinclair Refining Company, Technical Service Division, 600 Fifth Avenue, New York 20, N. Y. There's no obligation.

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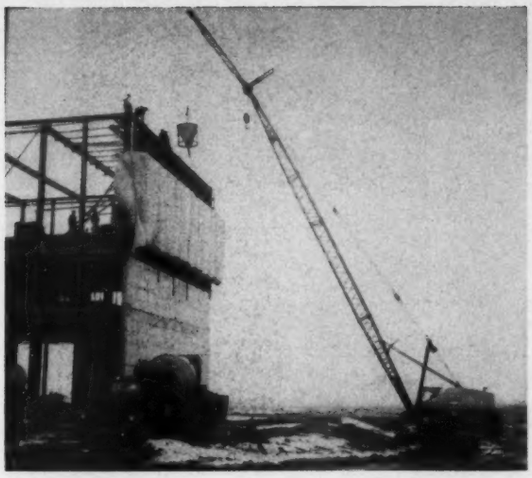
Careful planning of operations keeps job on schedule in spite of snow, mud, and cold



Concrete placing for the administration building is done by a Bucyrus-Erie 30-B crane with ¾-yard Gar-Bro bucket. Warm concrete is delivered by the International-mounted Challenge mixer.

Workmen dump warm concrete into the Efco forms that are protected during the curing period. Efco forms were used for all walls, slabs, beam sides, and rectangular columns.

plant is unusual in that all of the units are fitted into one economical composite structure. A multistory projection on the east side houses the chemical storage and feeding facilities and the heating plant. Another multistory wing at the northwest corner serves as administration building, but its top story houses the wash-water tanks for the filters.

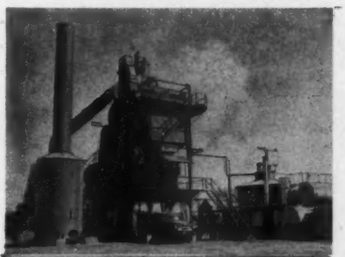
The remaining elements, from aerators through filters, are fitted together into a single rectangular structure measuring 400×820 feet. In this arrangement, practically all except the outside walls are common to two of the units.

Water reaches the plant from the Deer Creek Reservoir, some 35 miles away, through a 69-inch aqueduct and a 48-inch conduit from Little Cottonwood Creek, about a half mile away. After treatment in the plant, the water will be returned to the aqueduct and the Little Cottonwood conduit to continue on its way to the city, about ten miles to the north.

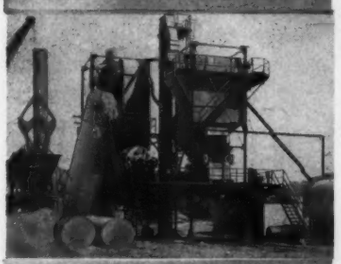
Water entering through the inlet control house flows through two 10×500-foot combination aeration and grit-collection basins, and then into ten 78×60-foot coagulation basins. Leaving the coagulation basins through a series of baffles, the water flows into ten 78×225-foot sedimentation basins. The covered filter building contains 20 sand filter units, each measuring 38×35 feet.

(Continued on next page)

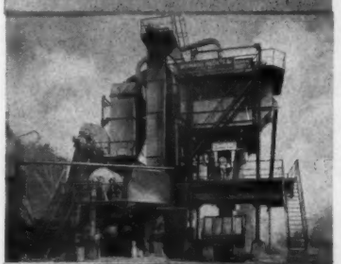
Efco forms are quickly assembled with a minimum of bracing for a wall on one of the buildings. The Servicised 6-inch double-bulb waterstop is being used in the joints. Some 17,500 feet of waterstop is being used on the job.



Asphalt Products Company's Model S-80, the sixth Simplicity bought by Dick Shorts of Youngstown, Ohio.



Barrett Division's Model S-100 at Cincinnati, Ohio. This is Barrett's fifth Simplicity.



Model S-200 of Bituminous Products, Buffalo, N. Y., their fourth Simplicity.

FACTS vs ARGUMENTS

Get the FACTS and NOT THE BULL on two important points before you buy any asphalt plant. The outstanding success of the Simplicity S-200 has caused claims (verbal) that our S-200 is our S-100 speeded up. Here are the FACTS:

Model	S-80	S-100	S-200
Rated Capacity (T.P.H.)	75 to 100	100 to 150	150 to 200
Dryer Volume (Cubic Ft.)	603	1,018	1,571
Dryer Speed (R.P.M.)	12	11	9
Air Volume (C.F.M.)	30,000	35,000	40,000
Fan Speed (R.P.M.)	900	800	800
Screen Area (Sq. Ft.)	96	140	180
Screen Speed (R.P.M.)	800	800	800
Bin Capacity (Tons)	50	50	85
Weighing Capacity (Lbs.)	6,000	7,500	10,000
Mixer Capacity (Lbs.)	5,000	6,000	8,000
Mixer Volume**	50.63	65.6	93.1
Mixer Speed (R.P.M.)	56	50	45
Total Weight	187,385	228,865	262,535
Total Price*	$94,500.00	$116,400.00	$132,800.00
Price Per Pound	.504	.508	.505

* Prices subject to change without notice. ** Cu. Ft. Below Shafts.

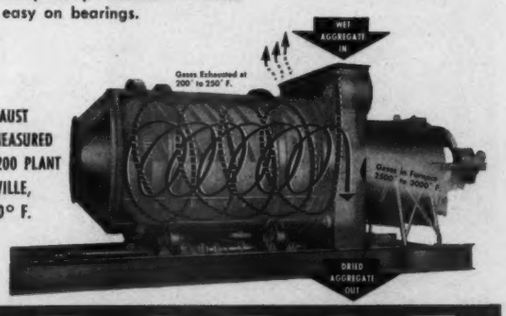
The only Dryer that starts at once without "warming up" . . . stops immediately without "cooling down"! Aggregates exposed to hot gases for twice the length of time. Aggregates placed in path of hot gases by cross showering.

Fuel bills are lowered 30% or more and any mechanic knows a horizontal Dryer is easier to operate and keep in top condition . . . takes less power, is easy on bearings.

RED LINES show flow of aggregates through outer and inner shells. Hot gases in inner shell are INSULATED and ABSORBED by cold wet material in outer shell.

There's a **SIMPLICITY PLANT NEAR YOU**
On request, we'll be glad to send you the name and location of a nearby installation.

ACTUAL EXHAUST TEMPERATURES MEASURED JUNE 1959 ON S-200 PLANT AT DOUGLASVILLE, GEORGIA--180° F.



DEPENDABLE

THE SIMPLICITY SYSTEM CO.
CHATTANOOGA 6, TENNESSEE

For more facts, use Request Card at page 18 and circle No. 292

(Continued from preceding page)

Wash-water and sedimentation troughs precast to close tolerances are stockpiled at the plant by a Bucyrus-Erie 30-B crawler. Some 350 of the units were precast by Utah Sand & Gravel Products Corp., Prestressed Concrete Division, Salt Lake City.

Build tanks in summer

Starting work quickly after the award of the contract last year, the contractor spread his crews over the entire work area, dividing the supervision among four superintendents, each working on one of the units.

Before concrete placement could begin, there was a considerable amount of earthwork to be done. This 180,000-cubic-yard item was sublet to Frank Barben and P. L. Henderson & Sons, Inc., both of Salt Lake City. They moved in a spread of DW21 scrapers, together with tractor shovels and trucks, to handle the excavation. Compaction of the fills was accomplished with sheepsfoot rollers followed by a Bros 50-ton rubber-tire compactor pulled by an International TD-24 tractor.

Using Efco form panels and hardware, the crews erected the wall forms very quickly. Practically everything except a few round columns and some beam bottoms were formed with the Efco panels. This included wall, slabs, beam sides, and rectangular columns. Slabs and beams were shored with Waco adjustable steel shores and Waco steel scaffolding. The few round columns in the structures were formed with Sonotubes.

The 30,000 cubic yards of concrete in the structure is being produced right on the job. Cement and aggregates are batched through a Koehring plant. A Model 955 Traxcavator feeds the inclined belt charging the aggregate bins, and two Challenge 6½-yard transit mixers on International trucks take the batches from the plant and deliver the mixed concrete to any point on the job.

Concrete for footings and other low sections was placed directly from the transit mixers; cranes and buckets served the higher forms. Much of the high concrete was placed by a Bucyrus-Erie 22-B truck crane and a 30-B crawler using ¾-yard buckets. Placement of up to 300 cubic yards was made in a day.

The combination of the smooth, true forms, a good mix, and careful placement—including vibration with Homelite vibrators—produced exceptionally good concrete with very few surface blemishes. This was true even when the placement was carried on under adverse winter conditions.

Winter construction

When snow and cold weather set in, work was suspended on the exposed basin areas, and the crews were concentrated in the administration and chemical buildings. Here the Efco forms again proved their merit; easy erection, a minimum of bracing and shoring, and smooth, true finished faces marked the work.

As the forms were erected, enclosures of lumber and canvas were erected around them, and Clayton Summeraire oil-burning heaters were installed under the covers. Warm water maintained the concrete at a

This Clayton Summeraire oil-burning heater is supplying heat for a lumber and canvas enclosure that protects concrete work on administration building walls.

MUSCLES under the mainline!

Rodgers Hydraulic Jacks

push three 88 foot tiles under railroad without disrupting traffic

Two 200 Ton Rodgers Hydraulic Jacks were selected by W. J. Irwin & Sons, Inc., Tonawanda, N. Y. for driving three sewer pipes of 96″ I. D. reinforced concrete tile 88′ under the mainline of the New York Central Railroad. Part of a 2½ million dollar sewer contract on the Tonawanda West Side Drainage Project, the "push pipe" method was preferred because it permitted unrestricted use of the rail right-of-way overhead.

TIME: 34 DAYS—Actual jacking time consumed 34 days based on three-eight hour shifts a day. Each sewer took eleven 8-foot tile sections. The *First Line* required 14 days; the *Second Line* 11 days and the *Third* only 9 days.

Steel rails cradle tile sections as twin Rodgers Jacking Cylinders press against the wooden jacking frame. Heavy grease on outside of tile cuts down friction—for easier sliding.

Rear of excavation pit showing Hydraulic Jack against abutment wall. At this stage the ram is extended approximately ⅓ of the 48″ ram travel.

ADVANTAGES OF HYDRAULIC JACKING—This job was handled at low cost and was unique due to the short time required for completion and the fact that rail service overhead continued uninterrupted throughout the tunneling project below. Entirely different from conventional tunneling, the "push pipe" method also provides greater safety to workers from cave-ins since they work inside the tile that is being driven.

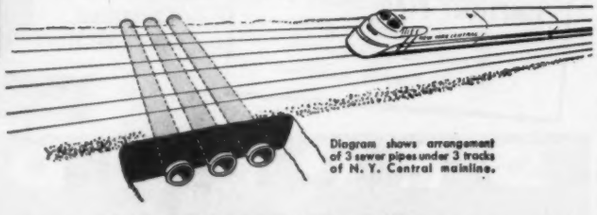


Diagram shows arrangement of 3 sewer pipes under 3 tracks of N. Y. Central mainline.

JACKING PROCEDURE—A service pit 28′ deep by 22′ wide by 40′ long was excavated to house the jacking equipment. A pair of 75 lb. steel rails placed on the concrete pit floor cradled the tile sections and acted as a guide for the jacking operation. Type of soil encountered in all three pipes was a mixture of heavy yellow and blue clay.

EQUIPMENT USED—Two 200 Ton Rodgers Hydraulic Jacks with 48″ ram travel were powered by a Rodgers Model D2 electric driven hydraulic pump located at the top of the excavation pit. A valve panel located at the bottom of the pit permitted accurate control of the jacking operation.

If you'd like more details about this job, write for free copy of Bulletin 331.

Rodgers Hydraulic Inc.

7415 Walker St. • Minneapolis 16, Minnesota

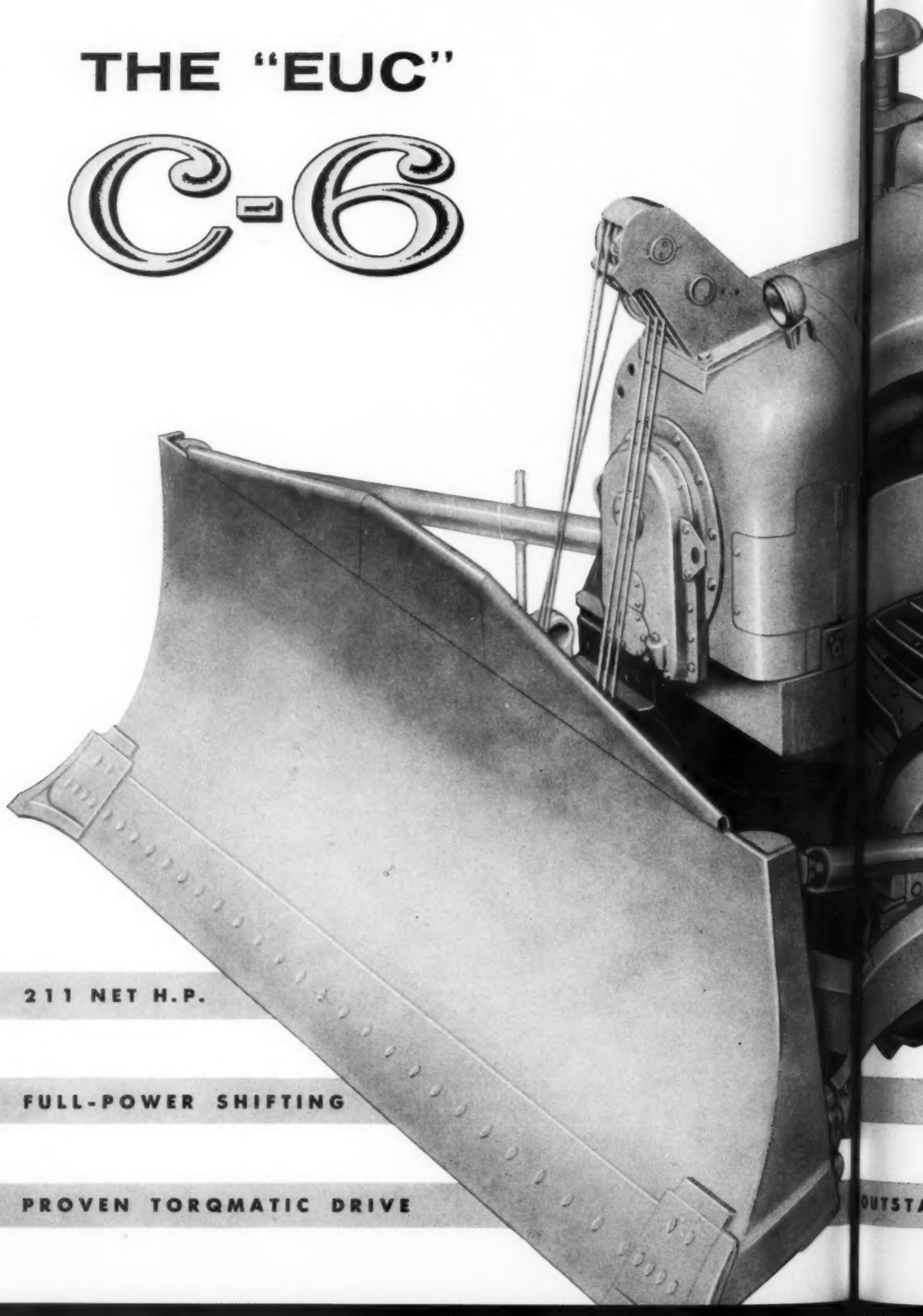
For more facts, use Request Card at page 18 and circle No. 293

EUCLID

PRESENTS...

THE "EUC"

C-6



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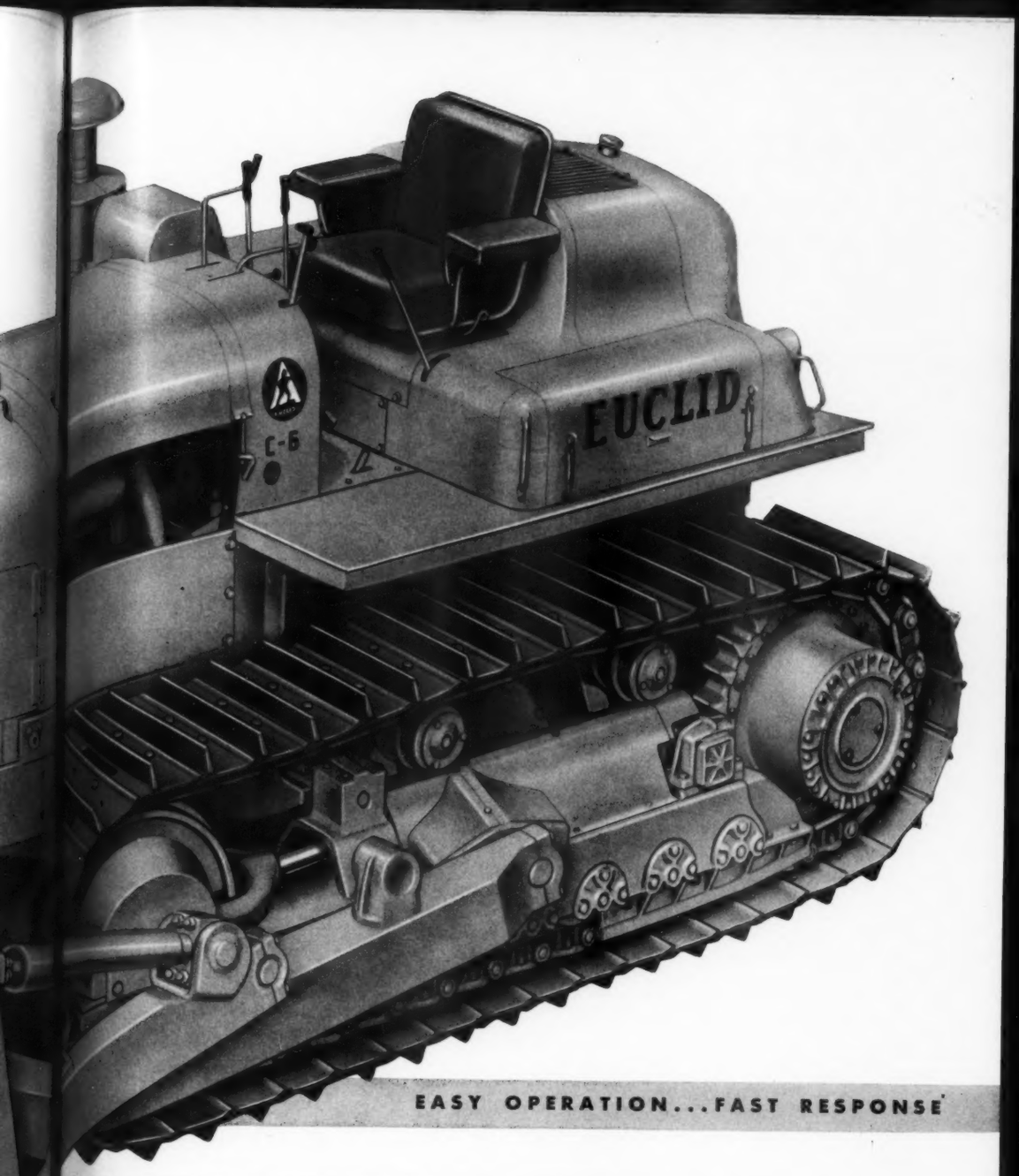
FULL-POWER SHIFTING

PROVEN TORQMATIC DRIVE

OUTSTA



EASY OPERATION...FAST RESPONSE

INDEPENDENTLY SUSPENDED FINAL DRIVE

OUTSTANDING ACCESSIBILITY...EXCELLENT MANEUVERABILITY

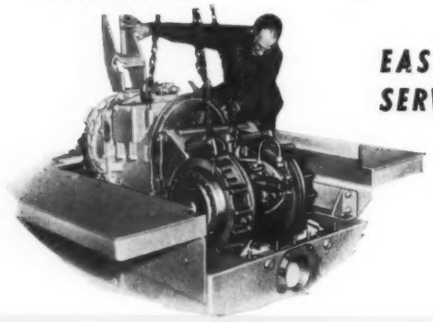
XUM

5 YEARS UNDER TEST...

the "EUC" C-6 provides New Crawler Standards

Proved by over 5 years of rugged field test . . . in mines, quarries, heavy earthmoving and logging as well as on the proving grounds. With 211 net hp. and proven Torqmatic Drive, the C-6 features full power shifting and time-saving maneuverability . . . has plenty of power and speed for dozing, ripping, pushloading scrapers and all other big tractor work.

Operators report that excellent visibility and over-all ease of handling give the C-6 smooth performance that gets more work done every shift . . . and with less downtime for service and maintenance.



EASY SERVICING

Maintenance designed—the C-6 has exceptional accessibility and all major components are "out in the open"—easy to get to. For example, the engine is easily serviced or removed, and the converter, transmission, steering brakes and clutches assembly can be removed as a complete "package" without major disassembly . . . final planetary drives can be serviced without removing sprockets or breaking track . . . there are considerably fewer lube points than in competitive tractors.

Have your Euclid Dealer give you the performance facts that prove the C-6 assures a better return on investment

GM GENERAL MOTORS EUCLID

EUCLID DIVISION OF GENERAL MOTORS

Cleveland 17, Ohio

EUCLID (GREAT BRITAIN) LTD.
Lanarkshire, Scotland

. . . a complete line of equipment for heavy earthmoving, mining, logging and many industrial operations . . .

over 50 degrees during placement, and the work proceeded on schedule. Once portions of the buildings were completed, L. B. White propane-burning circulating heaters were installed to provide warm areas so that mechanical, electrical, and other subcontractors could continue their work.

Brickwork on the chemical building was done right through the winter, except for the few days when weather conditions were too severe. Henry L. Ashton & Sons, masonry contractor for the chemical building, utilized a P&H Model 105 crane to handle the bricks. The bricks were banded into bundles or jumbos of 100, 200, and 400, and delivered on pallets by trucks. Using two pipes through openings left in the stacks and a pair of cable slings, the crane picked the 400-brick bundles off the truck and swung them either directly to the scaffolds or to temporary storage.

Using a special hook instead of the cable slings, the crane later distributed the 200-brick jumbos directly to the workmen building the walls. For further distribution, one set of the steel bands was broken to divide the jumbo into two 100-brick units. These the crane handled with a smaller hook. The use of these specially packaged bricks, and the crane to handle them, saved a great deal of time and labor on the job and kept an adequate supply of brick right at the masons' sides at all times.

Mortar was mixed in two Essick mortar mixers and wheeled to the masons. Warm water kept the temperature of the mortar high enough so that there was no danger of its freezing. Most of the winter, the masonry operations were carried on out in the open. Tarpaulins protected the new work overnight.

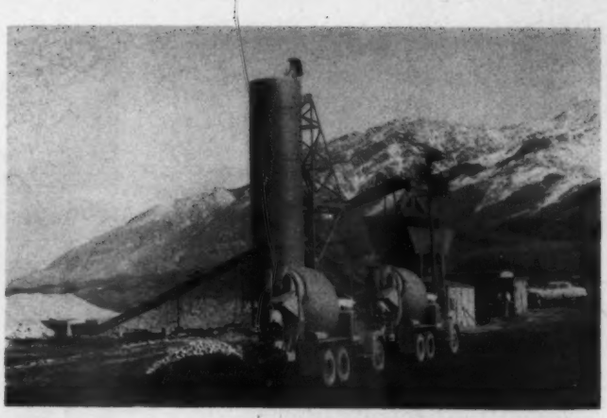
The erection of the steel building frames and the steel tanks in the chemical and administration buildings continued through the winter, stopping only when snow or ice made footing treacherous.

Elements are precast

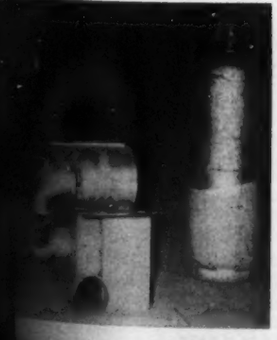
Under a subcontract, Utah Sand & Gravel Products Corp., Prestressed Concrete Division, supplied the precast filter underdrain bottoms and the sedimentation and wash-water troughs. The "wheeler" underdrain blocks measure 23.5×22.5×4 inches, with nine inverted frustums of pyramids, each terminating in a porcelain thimble. Two sizes of ceramic balls are arranged in the pyramidal area to provide positive drainage at the base of the filter beds.

Utah S&G had 26 special cast-iron forms built for the production of the filter blocks. Using the forms twice daily, it was able to produce 52 blocks per day. A standard mix using ½-inch aggregate, table vibration, and steam curing were employed to produce the very dense concrete. Follow-

(Continued on page 63)



This Noble plant turns out the concrete required during the winter; heated water maintains the mix at more than 50 degrees. Two Challenge mixers on International trucks serve the placing crews.



portions of the building were com-
d, L. B. White propane-burning
were used to heat work areas
used by crews of mechanical,
, and other subcontractors.

PIPE LINE-UP For Air!

It's no problem handling air under pressure for tool operation, with NAYLOR Spiralweld pipe on the job.

This lightweight pipe is designed with the exclusive lockseamed-spiralwelded structure to give you extra strength and safety required in "high" air service. At the same time, its easier handling speeds installation — saves you time and money.

When you need lines for handling air under pressure or for ventilation, water or dredging service, it will pay you to look into the advantages of NAYLOR pipe. Ask for Bulletin No. 59.

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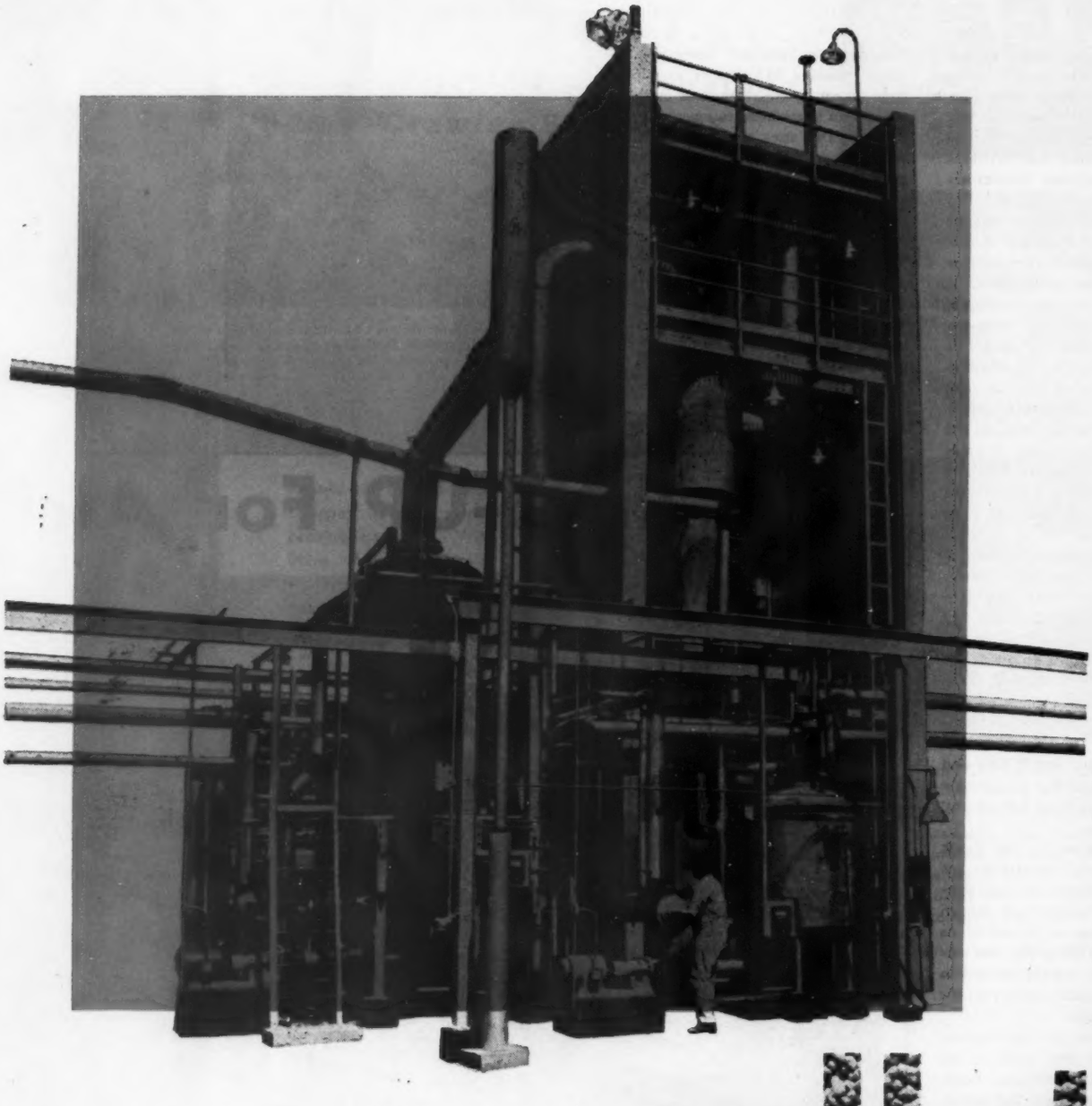
For more facts, use Request Card at page 18 and circle No. 295



Now Ammonium Nitrate in pellets

New $5,000,000 Atlas Plant
Produces Unique, Improved Blasting Agent

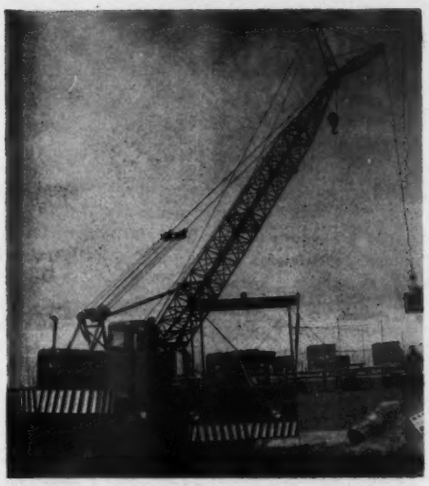
Atlas is now producing low cost Ammonium Nitrate in a new pelleted form designed especially for blasting. Atlas Pellets give oil absorption equal to prills, and flow freely for fast loading into all types of blast holes. The new blasting agent is being made in the new $5 million Atlas acid and ammonium nitrate plant near Joplin, Mo.

Not a granule, not a prill, Atlas Pellets are porous but compact particles which, when oiled, have both the density and sensitivity required for efficient low cost ammonium nitrate blasting. They are the latest advance in developing new products and techniques to help the user of explosives gain lowest possible blasting costs. Your Atlas representative can help you put these products and techniques to profitable use in your operation.

EXPLOSIVES DIVISION
ATLAS POWDER COMPANY
WILMINGTON 99, DELAWARE
Offices in principal cities

For more facts, use Request Card at page 18 and circle No. 296

Foot masonry work on the buildings is aided by the efficient brick-handling setup of the subcontractor, Henry L. Ashton & Sons, Salt Lake City. Bricks were delivered to the job site in bundles of 100, 200, and 400. ►



Jumbos of brick are swung to crews by a P&H 105. The crane uses a special hook to pick up bundles of 200 bricks, a smaller hook for 100-brick units, and two pipes and a pair of cable slings for 400-brick units. ►

(Continued from page 61)

ing the developments of this job, the company is now turning out these blocks as a production item.

The other items produced by this company were the 150 sedimentation troughs and 200 wash-water troughs. These units were 30 inches wide, 24 inches high, and ranged from 14 to 17 feet long. Wall thickness tapered from 2 to 3½ inches. They were produced one per day on a single steel form and steam-cured. One of the big problems was that of maintaining the overflow line within a maximum tolerance of ⅛ inch in the length of the channel.

Colorful building face

Among the interesting features are the colorful baked-enamel-covered steel wall panels in aluminum frames that make up the several faces of the administration, chemical, and filter buildings. The color will be predominantly green. These panels are being furnished by Ador Sales Corp., Fullerton, Calif.

Another feature was the installation of a large amount of rubber waterstop in the joints of the structures. The project used 15,000 linear feet of Servicised 6-inch double-bulb waterstop and 2,500 linear feet of the 9-inch triple-bulb type.

Personnel

John R. Butler, owner of the Davis & Butler Construction Co., served as project manager for the job. Two project engineers shared the general field supervision. In charge of the structural work was Jerald R. Clyde (son of Utah's engineer governor, George D. Clyde). The mechanical work was supervised by Marshall H. Bell. Supervision of the construction was divided between four superintendents, each handling the work in a specific area. Fred Jackson supervised work on the filters and sedimentation basin; Cree Kofford, on the chemical building; John P. Lyman, on the aerators and coagulation basins; and Tip Palmer, on the administration building.

The consulting engineers on the job were represented by resident engineer Richard P. Olbert, Howard M. Way, and John K. Beck. Chief engineer for the Metropolitan Water District is William C. Hague. THE END

It costs about $17,000 per year to maintain one mile of road on the Pennsylvania Turnpike System.

B - 451

EIMCO CHALLENGES YOU TO

COMPARE THE FACTS

NOT THE CLAIMS

	EIMCO 103	CAT D-4	CAT D-6	AC HD-5	AC HD-11	INT. TD-9	INT. TD-15	CASE 1000
Maximum Drawbar Pull (zero track slippage)	33,000	18,700	19,000	15,485	21,980	13,240	23,730	24,800
Torque Converter	Yes	No	No	No	No	No	No	Yes
Master Clutch	No	Yes	Yes	Yes	Yes	Yes	Yes	No
Power shift transmission on all speeds, with oil cooled metallic clutches that never need adjustment	Yes	No	No	No	No	No	No	No
Independently reversible track	Yes	No	No	No	No	No	No	Yes
Hydraulic track take-up	Yes	No	No	No	No	No	No	Yes
Heat-treated alloy steel grouser shoes, keyed to the track links	Yes	No	No	No	No	No	No	No
One-piece heat-treated alloy steel track rollers, tapered roller bearings	Yes	No	No	No	No	No	No	No
Equalizer bar of heavy duty heat-treated cast alloy steel, allowing full oscillation of crawler tracks with all attachments	Yes	No	No	No	No	No	No	No
Constantly running power take-off drives, front and rear, to standard SAE specs; with rear take-off not affected by track operation, and independent hydraulic pump drive allowing simultaneous use of hydraulic, winch and hoist accessories	Yes	No	No	No	No	No	No	No
Front operator's seat for full visibility	Yes	No	No	No	No	No	No	No
Ability to operate forward and backward on up to 90% slopes	Yes	No	No	No	No	No	No	No
Tractor guaranteed for one full year of single shift service	Yes	No	No	No	No	No	No	No

the "Model" of EIMCO 103 SUPERIORITY

WEIGHT BARE TRACTOR, POUNDS	15,000	10,910	17,605	12,600	20,300	11,925	22,540	13,200
H.P. — FLYWHEEL	100	62	93	66	99	71	105	90
TRACK GAUGE, INCHES (STD.)	60	60	74	60	74	60	74	60
STD. TRACK SHOE WIDTH, INCHES	16	13	16	13	16	13	16	16
LENGTH OF TRACK ON GROUND, INCHES	88	81	85⅝	86¼	85⅝	73	85⅝	79
TOTAL TRACK AREA, SQ. INCHES	2,820	1,589	2,744	1,739	2,744	1,898	2,850	2,528
GROUND PRESSURE, PSI.	5.3	6.9	6.4	7.3	7.5	6.3	7.9	5.2
TRACK ROLLER DIAMETER, INCHES	8	8	8	7⅝	7½	N.A.	10⅛	6
TRACK RAIL WIDTH, INCHES	1¾	1¼	1½	1¾	1⅞	N.A.	N.A.	1¼
NUMBER TRACK ROLLERS, EACH SIDE	6	4	6	5	6	5	6	5
TRACK BOLT DIAMETER, INCHES	⅝	⅝	⅝	⅝	⅝	⅝	⅝	⅝
TRACK BUSHING DIAMETER, INCHES	2⅝	2	2¼	2	2⅝	2¼	2½	1⅞
TRACK PIN DIAMETER, INCHES	1 11/32	1⅜	1⅜	1¼	1⅜	1¼	1½	1¼
SPROCKET PITCH DIAMETER, INCHES	32½	29½	30½	28½	31½	28¾	30½	24½
GROUND CLEARANCE, INCHES	17	11½	12½	11¼	12½	10½	11	16

N.A. — not available

Above is from manufacturer's data and other sources believed to be reliable, but cannot be guaranteed.

IT'S A FACT . . . not a claim . . . that here is a MODERN line of tractors that makes all other crawler-tractors old-fashioned!

Other exclusive features includes Unitized "Stress Flow" Construction, for far greater strength and rigidity; Self-cleaning Air Cleaner that completely eliminates ordinary routine cleaner maintenance and others, far too numerous to list here. Write for details and specifications on all the advanced engineering features of the modern Eimco 103 line of crawler tractors.

AVAILABLE IN FOLLOWING MODELS:

103 — TRACTOR AND DOZER
123 — FRONT END LOADER
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143 — LOG LOADER

THE EIMCO CORPORATION

EXPORT OFFICE: 51 - 52 SOUTH STREET, NEW YORK, N. Y.

TRACTOR LOADER DIVISION
634 SOUTH 4TH WEST
SALT LAKE CITY, UTAH — U.S.A.

For more facts, use Request Card at page 18 and circle No. 297

WINTER WORK

Big dividends from proper maintena

There is no season of the year when close attention to the maintenance of starter and ignition equipment, fuel pumps, carburetors, or injectors, as well as regular lubrication, will pay greater dividends to the contractor than during the winter. It is the time to enforce, more rigidly than ever, regular lubrication and maintenance practices.

In the first place, cold-weather recommendations of the manufacturer of a particular piece of equipment, or of the supplying oil company, should be closely followed, and recommended grades of winter lubricants should be secured from a reputable supplier. Winter fuels from such sources are most likely to be properly controlled to provide easy starting and carefully guarded to eliminate troublesome moisture content. High-quality lubricants are also less subject to thickening upon exposure to low temperature. All crankcases, gear cases, steering gears, diesel fuel pumps, etc., should be thoroughly drained and flushed and supplied with suitable winter lubricants.

It is necessary to drain engine crankcases regularly during cold weather. More frequent and prolonged use of the choke on gasoline equipment results in greater dilution of the oil with unburned or partially burned fuel, which blows past the rings into the crankcase. In diesel engines, raw or partially burned fuel also finds its way past the rings during the warm-up period. Condensation is also more pronounced during cold-weather operation.

Lower operating temperature

Engine operating temperatures, particularly in the crankcase, are generally lower in winter. This does not permit the oil to get rid of much of the fuel dilution and water. If water is allowed to accumulate in the crankcase, unburned fuel, together with dirt sucked into the engine, may emulsify to form cold-weather sludge. Thus, engine temperatures should be kept as high as possible by the use of proper thermostats, winter fronts, etc. The crankcase should be drained at least as frequently as in summer, and some authorities advocate more frequent changes in cold weather.

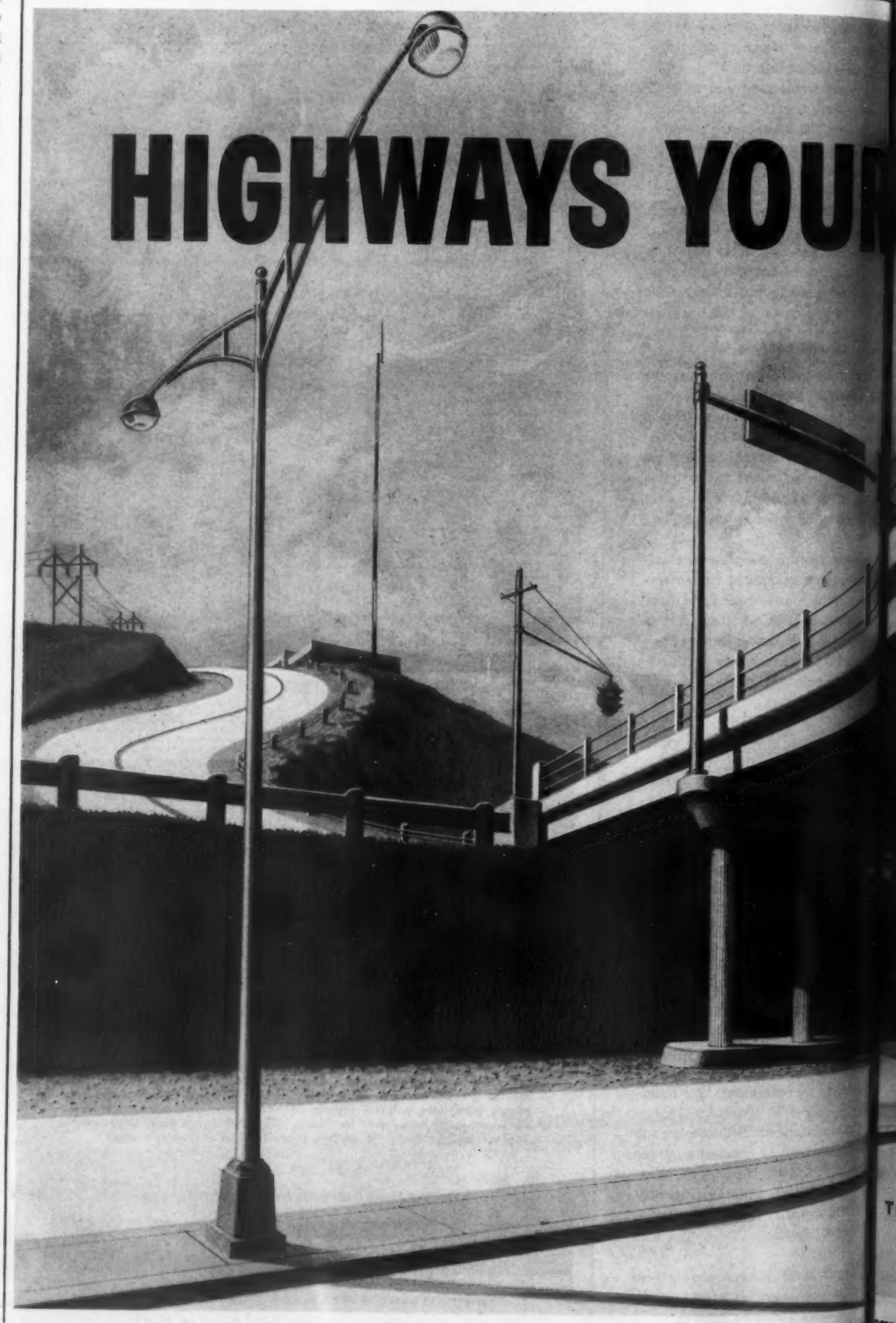
All radiators must be filled with antifreeze. This also involves thorough flushing and inspection of all connections and gaskets for leaks.

During cold weather, frequent inspection of fuel tanks and fuel systems should be made, and water from condensation should be drained out. Fuel tanks on equipment should be filled at quitting time to reduce the air volume in the tank and hold overnight condensation to a minimum. If ice clogs the fuel line, a pint of alcohol added to each tankful of fuel will be helpful. Do not use commercial alcohol-type antifreeze for this purpose, since many of these contain inhibitors that may be detrimental if introduced into the fuel system or combustion chamber.

Fuel pumps should receive careful attention during cold weather. A weak diaphragm or valve, which will furnish sufficient fuel in normal weather, may not do so at the reduced cranking speeds of a cold engine and battery.

The ability of a battery to deliver power is sharply reduced by low temperature. Rather than use a cold, weak battery to start a cold engine, it is far better to use a booster battery that has been kept in a warm place for this purpose. Some contractors have found it helpful to follow the practice of the Army in Alaska. It uses booster batteries, mounted on a pickup truck that stops at each piece of equipment on cold mornings; these batteries snap onto the regular battery terminals to start the engine. A fully discharged battery will freeze and rupture at plus 5 degrees F. Water should be added to batteries just prior to operation; otherwise, the layer of water on top may freeze before it has mixed with the acid.

Fuel should be strained through chamois during cold weather to remove moisture. But care should be taken to ground the fuel container to



EVIN T. BRENNER
duction Application Engineer Gulf Oil Corp. Pittsburgh, Pa.

the equipment to avoid the danger of static electricity.

All drums of fuel and lubricants must be turned on their sides when not under cover. This is particularly important in the winter when rain and melted snow collect on the heads of the drums and the moisture is sucked inside as the drums "breathe" due to temperature changes. Fuel drums should be moved as little as possible while filling equipment, since any water will be in the bottom and should not be mixed with the fuel. For the same reason, it is unwise to use the last few inches of fuel in a drum that has been outside for some time and may contain moisture or condensation. It is far better to throw a gallon or two on the ground than into the equipment, where the water can cause trouble.

Diluting oil

In temperatures of 30 degrees below zero and colder, it may be impossible to turn the engine over because the oil is too stiff. The Army in Alaska has found it helpful, in such cases, to dilute the oil with gasoline. The gasoline rapidly boils off during operation, and the oil is restored to its original viscosity. This may be done as follows:

1. Fill the engine crankcase to the full mark on the bayonet gage or dip stick with the proper grade of engine oil. Then put into the crankcase 1½ quarts of gasoline for each 5 quarts of crankcase-oil capacity.

2. Run the engine approximately 5 minutes to mix the lubricant and the diluent thoroughly.

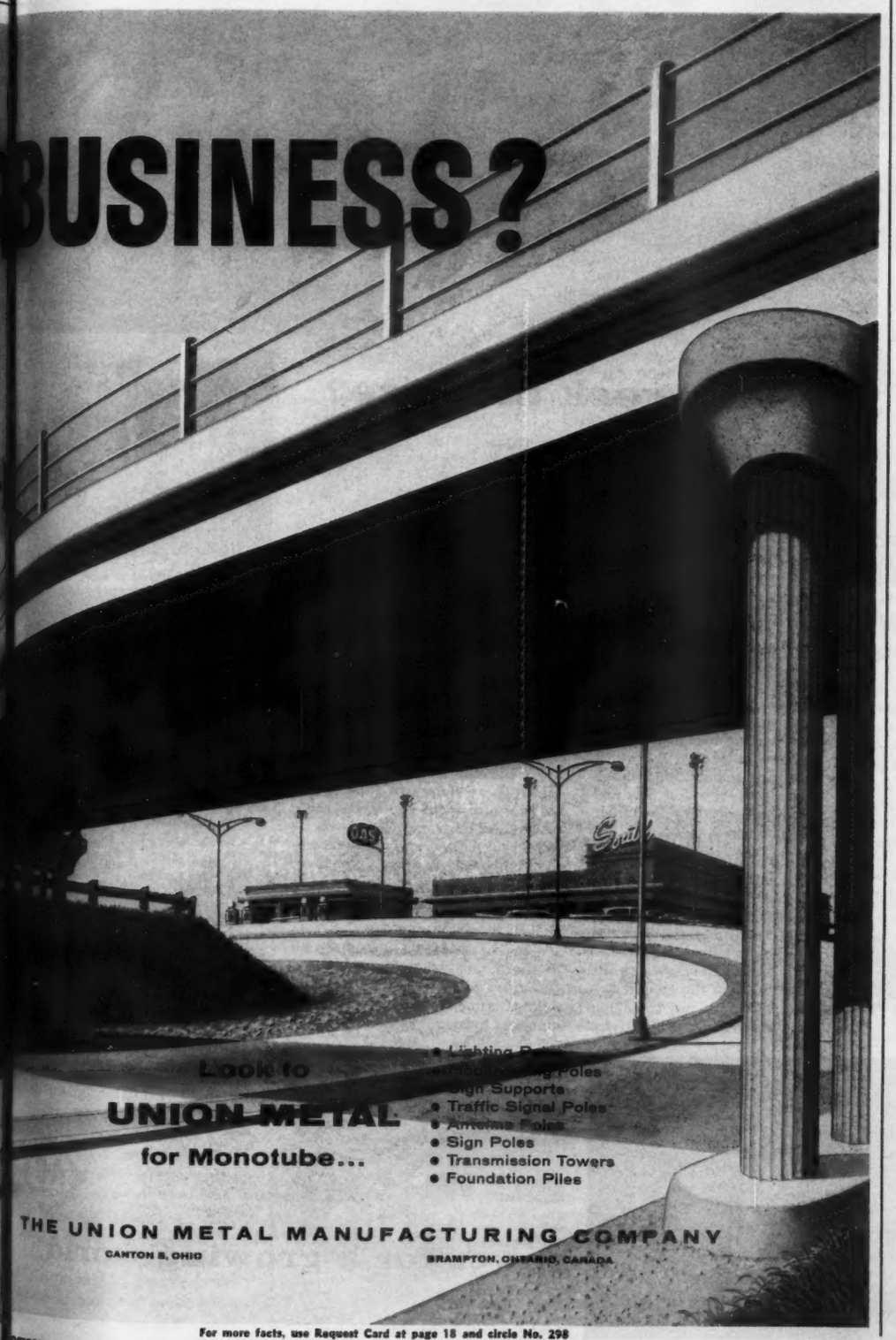
3. The first time the crankcase dilution is made, the level of the diluted oil above the normal full mark should be permanently inscribed on the bayonet gage. This level can then be used for future crankcase dilution.

4. If the vehicle is operated for 4 hours or more and it is anticipated that the vehicle will be left standing unprotected for 3 hours or more, it will be necessary to redilute the oil with gasoline in order to obtain satisfactory starting. In extremely cold weather, when the temperature is down around minus 50 degrees F, redilution should be made if the vehicle will stand for over one hour.

In spite of these precautions, some engines simply won't start on very cold mornings. In such cases, ethyl ether, which can be purchased at any drugstore, may be introduced into the air intake of gasoline or diesel engines in very small quantities just before starting. Some diesel engines are equipped with devices to introduce this starting fluid. Ethyl ether is very powerful and inflammable, and should be used cautiously and in very small quantities. Those who are not experienced in its use are advised to consult the engine manufacturer or serviceman.

Any equipment taken out of service during the winter should be properly protected. This will prolong its life and enable it to go back into operation with a minimum of preparation. The operator's manuals covering most contractor's equipment carry full instructions for properly preparing this equipment for storage. A fuel supplier can furnish instructions and the necessary protective oils and greases for this work.

THE END



For more facts, use Request Card at page 18 and circle No. 298

Lime stabilization and soil-cement use

■ The American Road Builders' Association has issued two bulletins: No. 242, "Orange County (Calif.) Experiences with Soil-Cement Use" and "Cement-Treated Subbase for Interstate 30 Pavement at Greenville, Texas." Summaries of both construction projects are detailed in the 50-cent bulletin.

No. 243, "Lime Stabilization Construction Manual," describes construction procedures for the use of hydrated lime in stabilizing marginal clayey base and subbase materials for highway and airfield construction. The bulletin is priced at $1.

Both bulletins may be purchased from the ARBA, World Center Bldg., Washington 6, D. C.

How would you load rock this size?

Shoot to size? Cable and lift? Shovel?

There are only two tractor shovels in the business built for work like this . . . the Allis-Chalmers 225-hp, 4-yd HD-21G and the 150-hp, 3-yd HD-16G. They're in a class by themselves. If you move ore, rock, gravel or overburden . . . if you need a machine that will pioneer, rip, load and handle a multitude of jobs, see them in action. They'll go it alone or team up with other machines to help improve your profit.

They walk to work.

Big capacity for big jobs.

Moving from job to job is easy.

Increase bidding power—You're way ahead in bidding flexibility with a big-capacity tractor shovel. Jobs miles away are simple transport operations with Allis-Chalmers BIG tractor shovels. Forget about expensive dismantling, problem loading, hauling and setup again at job site.

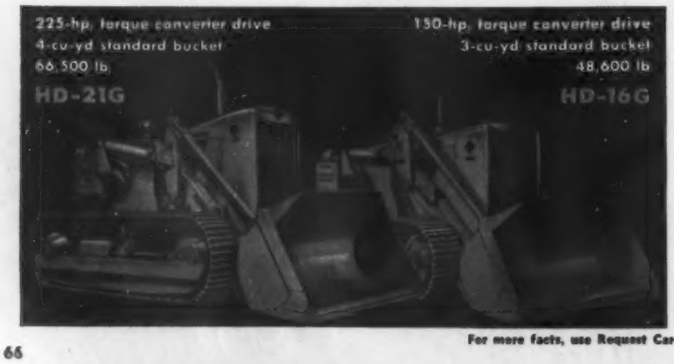
Handle scattered jobs economically—*Wherever* there's loading to do on a new job, these two dependable units "walk" to work . . . through mud—over rough terrain—those spots where *only crawlers* can go! They build their own roads—dozing, cutting, filling, compacting . . . load up to 4 yd at a clip*

What's more . . . BIG HD-21G's—16G's are not single-purpose units. They're pioneering machines. They'll open up new cuts or make quick work of clearing, piling stumps, brush or boulders. And, of course, loading, stockpiling and cleanup are their steady specialties.

They're ripping specialists—Long track, outstanding balance and power enable HD-21G's—16G's with rear-mounted Tractomotive rippers to open up tough material over *two feet deep*. Enough hydraulic penetrating pressure is developed to lift the tractor itself off the ground.

You *can afford* to use these big tractor shovels on many utility chores—from breaking up concrete roadbeds with 72,700-lb break-out force, to complete one-man, one-machine demolition operations. When you apply the abilities of the HD-21G—HD-16G to your own jobs, you'll see how either one or both of these production units can cut costs . . . put a *sharper point* on your favorite bidding pencil.

See your Allis-Chalmers dealer—He's the ONLY man with tractor shovels from 72 to 225 hp . . . from 1½ to 7¼ yd. He'll be happy to fill in the details—show you an Allis-Chalmers tractor shovel in action. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wis.



move ahead with

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power for a growing world

*Special-purpose buckets available up to 7¼ yd.

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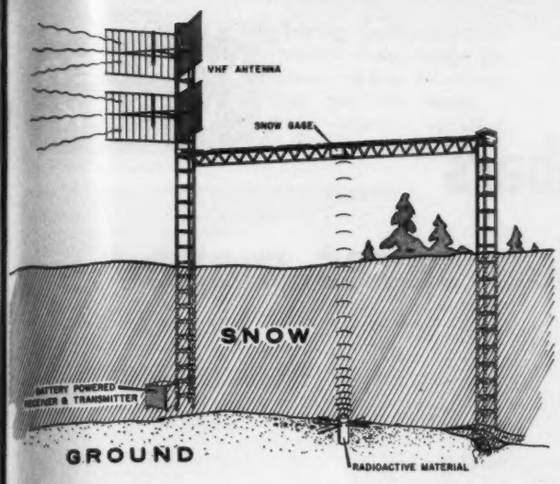


Compressed-air lines de-ice Greenland harbor

■ A new major blow has been struck against winter weather at Thule, Greenland, the U. S. Arctic defense post 800 miles from the North Pole. The test campaign, under the Navy's Polynaya Project, helped keep Thule's port open to shipping some 40 days past normal closing time.

An ice "buffer" at DeLong Pier frequently damaged ships' plates and also caused heavy damage to the pier itself as icebreakers moved supply vessels up alongside. To extend the shipping season, a de-icing system developed and pioneered by Atlas Copco was brought in. Compressed-air lines were anchored at predetermined depths about 50 feet apart next to the pier. Tiny holes drilled at precise intervals in the submerged lines caused new circulation currents from bottom to surface. The compressed air bubbling up from the bottom carried a dense saline solution to the surface and thereby prevented ice formation.

Total cost of the equipment, transportation, and engineering services for the initial Thule test was readily amortized by the extended operational period and the avoidance of damage to ships calling there. Total cost of the apparatus installed at the DeLong Pier was equivalent to the cost of replacing a single ice-damaged ship's plate.

Electronic snow gage aids flood-control programs

■ A recently developed electronic telemetering system, for measuring the water content of mountain snow packs, aids in the planning and operation of irrigation projects, flood-control programs, and hydroelectric plants by enabling engineers to obtain accurate data from remote areas.

Developed by the U. S. Army Corps of Engineers and Sierra Electronic Corp., Menlo Park, Calif., the system is known as the Model 211A telemetric system. As used in the Sierra Nevadas, it consists of a network of VHF radio antennas and towers constructed at six sites between Mt. Whitney and the Isabella Reservoir near Bakersfield, Calif.

The network is made up of a 20-foot H-frame tower at each of three snow-gage sites and two relay towers, all in remote areas. There is also a terminal tower at the Isabella base station. Each gage site contains a minimum amount of equipment: a radiation detector of the scintillation type and a radio transmitter, receiver, battery, and control unit.

Radiation for measuring the water content of the snow is supplied by a small deposit of radioactive cobalt buried at ground level. Directly above the cobalt at 15 feet is the radiation detector. As the radiation from the cobalt passes through the snow to the detector, some radiation is absorbed in proportion to the amount of water in the snow. The electrical impulses from the detector, corresponding to the amount of radiation it receives, are transmitted through the relay stations to the Isabella base station and recorded on paper tape.

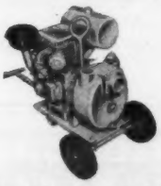
The snow gage operates in response to query messages, which are steady tones of selected frequency transmitted from the base station through the relay stations. As each unattended site receives its interrogation, the battery-powered VHF radio transmitter is switched on and the hydrological data beamed to the base station.

There are two channels of communication between the base station and each of the gage sites. One is used for transmitting queries to the gage and the other for transmitting water-content data back to the base.

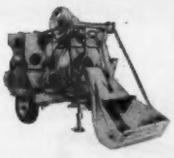
your Golden Buy in construction equipment

TRANSCRETES
. . . with real money-making, cost-saving features including SWING-OUT HOPPER, trouble-free FLOATING DRIVE. 18 MODELS. Truck Engine Drive and Separate Engine Drive in 5 sizes to 7-yards mixing capacity.

PLASTER & MORTAR MIXERS
. . . exclusive CMC "Triple-Hoe" mixing action for better quality, quicker mixes. 4 to 12 cu. ft. sizes.



DUAL PRIME PUMPS
. . . automatic priming, self-cleaning. Capacities from 4000 to 240,000 g.p.h. Gasoline, diesel or electric. ALSO DIAPHRAGMS, OTHER TYPES.



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. . . rugged, compact, easy to spot, easy to move. Make you more money on every job. From 3½S to 16S sizes.

CMC 50th Anniversary LINE 1909 - 1959

50 YEARS OF PROGRESS IN PRODUCING THE BEST IN CONSTRUCTION EQUIPMENT

1959, our Golden Anniversary year, marks 50 years of continuous progress in the design and manufacture of construction equipment that does the job *better* and at *less* cost. Our 50 years of experience and know how is one of your best guarantees that CMC products will *always* be of the *most advanced design* — and as traditional — your *finest* buy for *dependable, low-cost, trouble-free operation.*

Sold and serviced throughout the nation by a network of *"America's Best Distributors."*

CONSTRUCTION MACHINERY COMPANY
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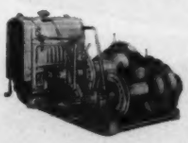
CENTRAL PLANT MIXERS
. . . designed to speed up production on big jobs and in commercial ready mix plants. Three sizes . . . 1, 2, and 3 yard capacities.



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The welder, working with a Lincoln 400-amp machine that supplies juice for the operation, quickly welds rebars into place for the 4-foot 9-inch foundation slab for a cement transfer silo. Workmen wiring the rebars would have been slowed down by cold hands.

WINTER WORK

Welding rebars on winter job saves money

by Bill Allen, field editor

Pearson Construction Co., Benton Harbor, Mich., keeps several jobs going through the winter months. On one of them, it cut costs and got good production by welding rebars instead of tying them.

Maka Fiberglas-insulated concrete-curing blankets, which consist of 2 inches of Fiberglas insulation between two layers of Visqueen 4-mil plastic, are rolled on the concrete to protect the surface. Carl Johnson, superintendent on this job, looks on.

"Sure, we keep running through the winter," says F. J. Beal, vice president of Pearson Construction Co. "But it costs us extra money. Don't think it doesn't.

"These Michigan winters are rough. When we schedule a building for winter construction, we allow for the extra cost in our bid. Just how much we have to allow depends on the shape of the building. But we've been working through these winters for many years. And each winter we try to figure out ways to improve our methods and decrease our costs."

Winter welding

One method that helped Pearson cut costs last winter was welding rather than wiring the heavy reinforcing steel in a big foundation slab.

The company was building foundation slabs 4 feet 9 inches thick for a group of cement silos in St. Joseph, Mich. The ten transfer silos were built for the Huron Portland Cement Co. Pearson had the contract for only the foundation slab.

There was almost as much steel as cement in the slab. In places, the heavy No. 11 bars were crowded into the forms in five separate layers. The bars, often spaced less than two inches apart, had to be positioned accurately.

In cold weather, hand wiring of rebars is ordinarily a slow process. A workman's hands get as cold as the steel he is handling. It slows him down.

In welding, however, a man is using his fingers as much, and he can move right down the line. The faster he welds with a hot arc within inches of his hands, the warmer he gets.

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CONSTRUCTION on the moon! This idea made headlines recently—and who is to say "No" possible..."

So, since SOILTEST engineering testing equipment is now being used on Arctic ice, desert wastelands, steaming jungles, as well as in the most up to date university and professional testing laboratories in 105 countries around the world, it follows that when construction begins on the moon, moon soil samples will be tested first on SOILTEST apparatus.

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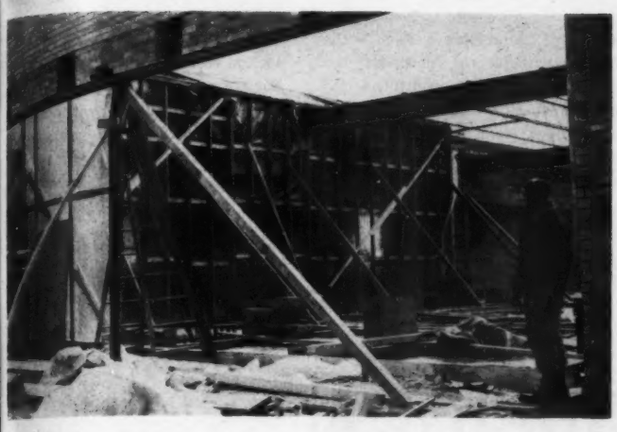
Another winter job for the Pearson company was construction of the Kroger Supermarket in Benton Harbor. Enclosures protect the men and the work; a conveyor facilitates material handling.



◄ The inside walls of the supermarket are enclosed in Visqueen plastic on wood panels 20 feet wide and 16 feet high. The 2×4 studs are on 2-foot centers; the horizontal 1×4's are 4 feet apart.

The outside of the supermarket is protected by a wall of canvas draped on tubular steel scaffolding. Bricks, concrete blocks, and mortar are fed to bricklayers by a Fairfield conveyor powered by an electric motor. ►

On this job, two Lincoln 400-amp welding machines supplied the juice as well as some heat to the welders. A mild rod was used to tack the bars into position. The separate layers of steel were supported on welded frames made of rebars.

The company found that when rebars were welded, the steel was positioned more accurately and securely. The method increased production enough to justify the additional cost of the welding rod and the operation of the two welding machines.

Cold-weather concreting

Before the concrete was placed, the wood forms were covered with tarps, and Master Model 160 space heaters warmed up the steel and forms to well above the freezing point. Preheated ready-mix concrete, with a 1 per cent calcium-chloride additive, was then bucketed to the forms.

Shortly after the concrete was finished, Maka Fiberglas-insulated concrete-curing blankets were laid on the surface. The blankets are made of 2 inches of Fiberglas sandwiched between two layers of Visqueen 4-mil plastic. As long as the plastic is not punctured, the blankets remain watertight. Both 4 and 6-foot-wide, 16-foot-long rolls were used on the job.

While the blankets were in place, the temperature of the surface of the concrete never dropped below 75 degrees. Normally, they were left on the concrete for about 5 to 7 days. The insulation blankets stood the wear and tear of the construction job quite well. The contractor got about ten re-uses out of them.

Bricklayers keep working

Pearson Construction Co. had as many as five buildings under construction at one time during the winter. Among them was the Kroger Supermarket in Benton Harbor. The 100×140-foot building was enclosed by 17-foot-high brick and block walls. The exterior walls helped support the steel bar joists that carried the metal decking.

Although the contractor got the ground slab in before cold weather, the walls had to go up during the middle of the winter. To protect the work from the weather, Pearson enclosed about 150 feet of the wall at a time.

On the outside, the enclosure consisted of canvas draped on tubular steel scaffolding. On the inside, the protective skin was of Visqueen 4-mil plastic secured to a wood frame. The frame was made up of 16×20-foot panels with 2×4 studs on 2-foot centers. The panels were held upright by A-frames loaded with concrete block. Canvas, secured to a wood frame, formed the roof of the tentlike structure.

Scaffolds loaded first

Before the canvas was draped on the scaffolding, the scaffolding was stocked with a supply of brick and block. This extra weight held down the protective structure and tended to prevent high winds from blowing it over. It was also more convenient to stock the scaffolds with the canvas out of the way.

When this initial supply of brick and block was used up, inclined conveyors carried the brick, block, and heated mortar to the bricklayers on the scaffold. On the longer wall

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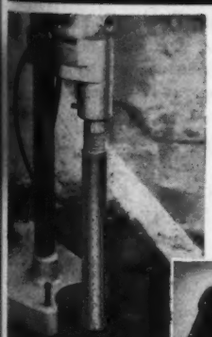

Drilling holes in minutes through reinforced concrete for installation of guard rails on this loading dock, is just one of the many industrial applications for Clipper Surface Set Oriented Diamond Core Bits. For more speed and economy in your drilling jobs call your Clipper Factory Trained Representative for prompt attention right on your job. Call Clipper COLLECT for the address of your closest factory branch.

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For more facts, use Request Card at page 18 and circle No. 303

All Jackson Safety Caps–

The Life Guard Cap, the fiber glass cap and the Alumicap allow pivoting of arc welding helmets, goggles and face shields from factory-installed brackets:

- **Cap-and-Helmets** with choice of three fiber glass helmet styles and three styles of glass holders.
- **Cap-and-Goggles** with three types of goggles for gas welding and grinding.
- **Cap-and-Face Shields** with plastic visors in various sizes, thicknesses, clear and in tints of green, a wire mesh and a welding lens visor.

All Jackson Safety Hats–

- **Face Shield F-1** fits the three types of Jackson hats. Two aluminum frame parts, pivoted together, hug the hat brim, are firmly held by elastic band. Same choice of visors as described above for Cap-and-Goggles.

Jackson Products

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Sold Everywhere by Better Welding Supply and Safety Products Dealers

For more facts, use Request Card at page 18 and circle No. 304

Warmth is provided inside this enclosure by a Chausse blower heater. Two heaters were used for a larger enclosure at the site.

(Continued from preceding page)

sections, two conveyors stemmed out from a central point to supply the bricklayers.

Normally, two large Chausse oil-fired blowers were used to heat about 150 feet of the enclosure. Even with outside temperatures dropping to zero, the bricklayers continued to work in comfort. Inside temperatures ranged from 50 to 70 degrees. The Chausse heaters were particularly good when the men were working near the top of the wall. Since the heaters were equipped with exhaust pipes leading to the outside, there was no danger of the fumes reaching the men.

But this extensive type of protection costs money. On this building, Pearson estimates that the wall construction cost 20 per cent more than it would have in the summertime. The total cost of protecting the wall, including labor, materials, and heating was $3,000.

Personnel

The president of the construction company is Joel G. Pearson. Carl Johnson superintended the work on the cement plant. Don Siewert supervised the construction of the supermarket. THE END

Snow-melting system provides nonskid surface at highway toll booths

■ A hot-oil snow-melting system will eliminate traffic jams at toll booths during winter operation of Chicago's Calumet Skyway bridge. Concealed beneath the concrete, a serpentine-grid network of welded carbon steel piping circulates 1,100 gpm of heated light oil to warm the roadway to 34 to 36 degrees F and keep the 25-lane toll plaza free of ice and snow.

The oil is heated in heat exchangers to a maximum of 160 degrees F by steam from two 200-hp boilers located under the toll plaza. It is circulated to the road area through all-welded piping that starts at 8 inches in diameter and decreases to 5, 4, 3, 2, 1¼, and ¾ inch.

The system covers an area of more than 58,000 square feet, giving cars from 120 to 160 feet of bare surface for slowing down and 40 feet in which to pick up speed again.

Many changes of direction and connections in the buried coils of pipe, as well as in the pipes leading from boilers to pumps to the road area, are made with welding fittings manufactured in Louisville, Ky., by The Turns Division, Chemetron Corp., Chicago. This type of fabrication is said to permit unimpeded flow conditions for the heat-transfer oil and provide permanently leakproof connections that obviate future maintenance problems.

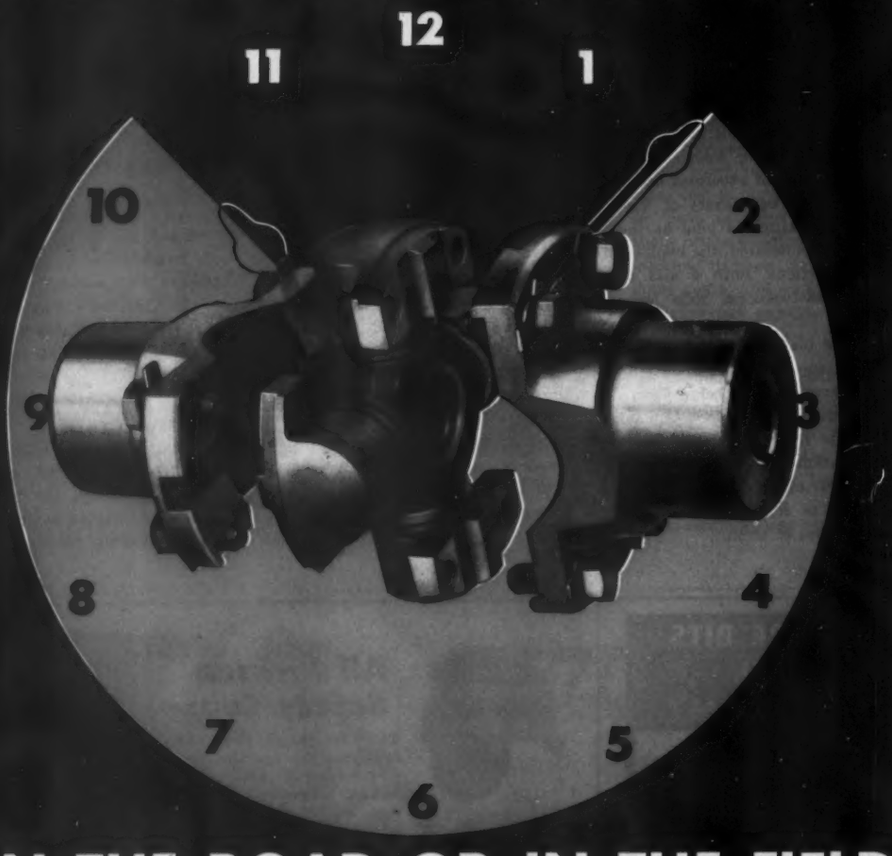
Film on new Cat tractor

■ "The No. 619 Tractor," a 16-mm sound and color film, shows the latest addition to Caterpillar Tractor Co.'s line of high-speed rubber-tire machines. The 10½-minute motion picture demonstrates the capabilities of the new 225-hp tractor with matched 18-yard heaped scraper.

Actual field-service sequences illustrate new features in accessibility—swing-away dash, flywheel clutch, cable control, differential, and transmission.

To see the film, contact the nearest Caterpillar dealer to arrange for a showing.

FIFTEEN MINUTE SERVICING



ON THE ROAD OR IN THE FIELD

Manufacturers recommend that universal joints be removed, cleaned, lubricated and replaced at regular intervals. The down-time required can be reduced from hours to 15 minutes—by equipping your product with MECHANICS UNIVERSAL JOINTS. The bearing assembly can be lifted out, simply by removing the screw bolts. Because keys and keyways are ground to fit there is no danger of destroying the original accurate alignment and balance. Let our engineers show you how this exclusive feature of MECHANICS UNIVERSAL JOINTS will give your product competitive advantages.

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QUICK TO LOAD AND HIT THE ROAD

The Allis-Chalmers TS-160 has stepped ahead in the 7- to 10-yd class . . . for good reasons!

TS-160 power, speed and exclusive advantages save you time in the cut, give you good getaway power, send you to the fill with a full load. Here's a unit that fits any fleet—can hold its own on production work and pays its way working solo on spot utility and clean-up. Here are the features—look 'em over carefully.

Exclusive double-acting bowl jacks. These jacks exert tremendous two-way power—down for fast penetration and big loads in all kinds of material—up for quick getaway. Double-acting pan control also lets operator clean up ditch, shine slopes, landscape and finish roads to blue-top specs.

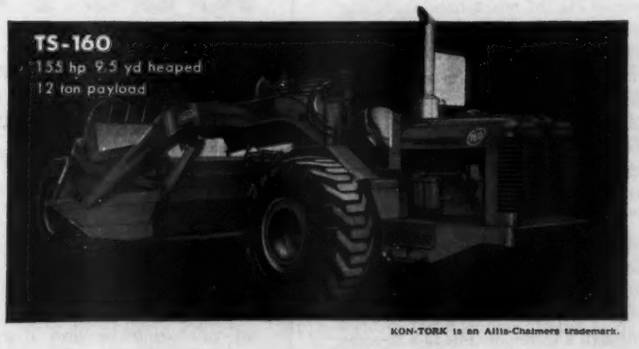
Highest hp to struck capacity. The powerful Allis-Chalmers engine delivers up to 22 hp per struck yard. More than any of comparable size. That's why the TS-160 loads faster—gets out of the cut quicker with or without a pusher.

Highest rimpull. When it's power you need—in the cut, on haul roads, soft spots or on steep grades—the TS-160 gives you more than 19,300 lb of rimpull—from 17% to over 37% more than others in its class.

KON-TORK differential. When ground is soft or muddy, the KON-TORK differential constantly transfers power to the driving wheel with the best traction.

In addition, the TS-160— . . . turns non-stop in 24 ft, 8½ in. . . . with finger-tip, 90-degree steering . . . uses positive, forced ejection to doze all material through high, 85½-in. apron opening . . . distributes loaded weight equally on all wheels for maximum flotation . . . rear wheels run *inside* the 97½-in.-wide cut.

Your Allis-Chalmers dealer has all the facts—see him before you add your next scraper. He'll be glad to show you why a TS-160 may be just what you've wanted to add flexibility to your fleet. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.



KON-TORK is an Allis-Chalmers trademark.

move ahead with ALLIS-CHALMERS...power for a growing world

For more facts, use Request Card at page 18 and circle No. 306

A Cat D9 with Kelley ripper is put through a tough winter test at a Mesabi Range iron-ore mine in Minnesota to compare the effectiveness of ripping and blasting in frozen overburden. Impressive time and cost savings were shown by the test.

Tests in frozen overburden give ripping edge over blasting

■ The economy of ripping frozen overburden—rather than blasting it—was shown graphically in extensive tests run by Caterpillar Tractor Co., Peoria, Ill., on the Mesabi iron range. Results showed large time savings and a reduction of more than 50 per cent in costs.

The 320-hp Cat D9 with Kelley 8-foot ripper used in the test weighed close to 90,000 pounds and developed over 63,000 pounds maximum pull at the tooth tip. This force pulls the tooth through the overburden, causing it to crack the frost and then shatter it into small pieces. During the test, two types of overburden were encountered: paint rock and sandy boulder-strewn clay. The clay is the most difficult material encountered.

At one pit, in a heavily bouldered area containing 4,635 square feet of sandy clay frozen to a depth of 5 feet, the tractor-ripper did the job for 3 cents less per cubic yard than the cost of powder alone. Calculated costs to drill and shoot were $416, including labor, drills, caps, and powder. In 8 hours the tractor-ripper had completed thorough ripping of the area. Ripping costs came to $173, including depreciation, fuel, labor, projected repairs, and maintenance. At that rate, in the toughest conditions encountered during testing, the ripper saved $243 per day, for 42 per cent of the total cost of shooting, and would have paid for itself in 255 days' work.

In ideal conditions, the tractor-ripper broke the 4-foot frost in the paint-rock test area for 11.2 per cent of the estimated drilling and blasting costs. The estimated expense to drill and shoot the 18,000-square-foot area was $1,551. In one 8-hour shift, the tractor-ripper had completely ripped the area. Total cost: $173, a difference of $1,378. At that rate, the tractor-ripper could pay for itself in only 45 days. Powder costs alone for this job were calculated at 27 cents per cubic yard; ripping costs were 7 cents per cubic yard.

Another economy feature that showed up is the tractor-ripper's ability to double in utility jobs when not on a production assignment. At one mine, the unit built a road through a frozen ore pile to a wrecker shed. A few hours before, a tractor without a ripper had tried the same job and couldn't dent the material with its bulldozer.

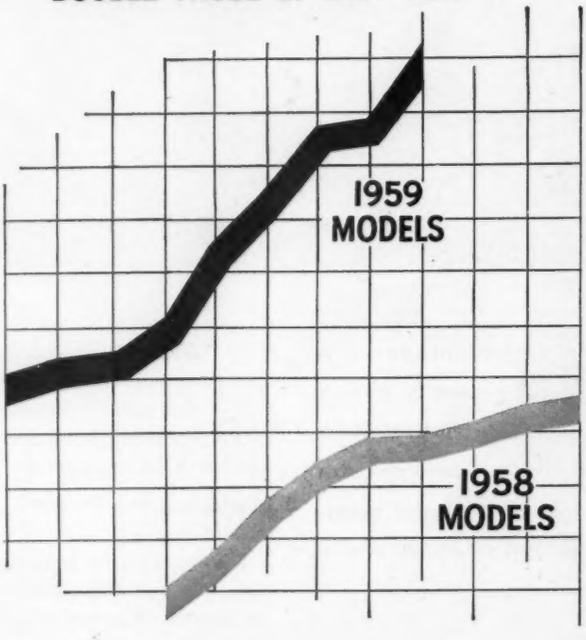
Motor grader solves a snow-removal problem

■ Snow removal on the Quebec-Chicontimi road in the hilly region of Canada's Laurentian National Park used to be taken care of by V-plows and wings. However, the major disadvantage was that the snow was not pushed far enough from the pavement across the ditch, and when the snow melted in the spring, a great deal of the gravel would be washed away from the shoulders and down the mountain.

To solve the problem, the Quebec Provincial Government added to its equipment fleet a Huber-Warco 5D-190 motor grader with a power-sliding moldboard and snow blower. Under the new system, the regular snowplows push the snow as far as possible from the pavement; then the 5D-190 is put into action. With the power-sliding moldboard extended to the furthest limit, and the snow blower mounted on the moldboard, the rig plows and blows the snow so that the cut extends beyond the ditch line. Now, when the snow melts, the gravel remains intact, since the main part of the snow is across the ditch and the water runs off in the ditches.

The BIG SUCCESS

1959 FORD SUPER DUTY TRUCK SALES MORE THAN DOUBLE THOSE OF LAST YEAR



1960 FORD SUPER DUTIES

SKYROCKETING SALES OFFER ADDED TESTIMONY TO THE TOUGHNESS AND RELIABILITY OF FORD "BIG V'S"— *NOW* THEY'RE MORE DURABLE, MORE FLEXIBLE THAN EVER!

Ford's increase in sales of Super Duty Trucks, while impressive in itself, by no means tells the whole story. Over half of the 1959 unit sales were the result of repeat orders from operators like Trucking Contractors, Inc., who bought because the Ford "Big V" provided the kind of performance and durability needed for their work.

And for 1960, the Ford Super Duties offer additional refinements designed to provide an even greater degree of dependability. Bigger optional axles and increased GVW's permit greater payloads and more profitable operation. Automatic radiator shutters to keep the engine temperatures within the most efficient operating range, submerged-type electric fuel pump to prevent vapor lock, and redesigned wiring for longer, more dependable operation are but a few of the improvements which add to the performance and durability of these units.

The changes offered for 1960 tested and evaluated by Ame foremost independent autom research organization. The co results of the studies by thi partial firm (name availabl request) provide proof that F Super Duty Trucks are even dependable.

- **Certified Durability through temperature control!** Indepe research engineers certify that thermostatically controlled r shutters kept water tempe between 168° and 188° in mountain grade operation. Th truck with shutters blocked

WINDROWED SNOW is blown 40 to 50 feet away from the road by a blower-equipped Michigan Model 75A tractor shovel owned by the city of Cudahy, Wis. After a snowfall, the rig's bucket is replaced by a 10-foot V-blade to plow streets and alleys. To clear snow from main traffic and business routes, a Sno-Thro blower is used. The 4-wheel-drive machine has high-traction tires and requires no chains.

Make use of winter for equipment maintenance

■ The winter lull can mean future savings in both time and money for contractors. When a machine is shut down for a long period, the time can be made to work for the owner. Here are some suggestions on how this can be accomplished for 2 to 6-month storage periods.

Diesel engines and starting engines: Internal surfaces of the engines should be kept coated with oil, either by periodically operating the engines or by spraying them with preservative oil. Regular attention to this matter is particularly important when the parts involved have machined surfaces. Oil tends to drain from these smooth surfaces more readily than from rougher surfaces.

Fuel tanks of both the gasoline starting engine and the diesel engine should be protected. The starting-engine tank should be filled completely with gasoline containing a gum stabilizing additive. The diesel tank should be filled with fuel to which enough preservative lubricating oil has been added to achieve a 3 per cent mixture.

Track-type tractors, pipelayers, and front-end loaders: The cork-rubber sealing surfaces on the final-drive seal assemblies may stick to the wear washers on track-type tractors, pipelayers, or front-end loaders that are allowed to stand for lengthy periods. Should this occur, the seals will, in all probability, be damaged and cause leakage when the machine is again operated. To prevent this, the machine should be driven forward and backward occasionally during the storage period.

Usually the most convenient time to accomplish this is when the engine has been started to renew the oil film on the cylinder walls and piston rings; this should be done at least once every 30 days. At the same time, the oil film should be renewed on all the moving parts of the machine. This can be accomplished best by driving the machine for a sufficient time in all gears to thoroughly circulate the oil in the transmission and final-drive compartments.

Wheel tractors and motor graders: The oil film can be renewed on the moving parts of a wheel tractor or motor grader by driving the machine a short distance at the time the engine is operated to renew the oil film on the cylinder walls and piston rings. When a machine has been placed on blocks for storage purposes, the same results can be accomplished by shifting the transmission into all gears while the engine is running.

In neither of these cases is it necessary to operate the machine until the transmission oil becomes warm. However, ample running time should be allowed so that the oil will be circulated thoroughly over all moving parts.

...f the Big Truck Field

"Bought 8 in '58—bought 20 more in 1959," says Curtis E. Bruel, President, Trucking Contractors, Inc. "In 1958 we bought 8 Ford T-850's with lightweight chassis options and specially built 5-batch bodies which gave us a full extra batch per truck. A 5-batch load is a real strain on the truck when you consider we're 'running the ditches' on this highway paving job in North Dakota. These T-850's worked out so well that we ordered 20 more in '59. Our Ford Tandems with the 477 engine give us good mileage and the drivers are real happy with them. It's a rough go on trucks with soft footing and dust so bad we have to drive with headlights on. Despite such operating conditions, downtime has been negligible and these '477' Fords have given us less trouble than other trucks we have operated."

...with Certified Durability

...ner same operating conditions had ...mperature range from 102° to ... The temperature variation of ...ine with shutters means less ex...sion and contraction in engine ...t and cylinder heads. Higher ...peratures with radiator shutters ...mit leaner fuel-air mixtures with ...possibility of raw gas washing ...m cylinder walls. Warm oil circu...s more freely, reducing internal ...ion. All these factors contribute ...nger engine life.

...ed Dependability with longer-...d electrical system! Ford's '60 ...ered wiring harness and the ... wiring harness were subjected ...ber table tests plus constant exposure to oil and water vapors and temperatures of 200°. Certified results prove that the greater resistance to deterioration by heat, oil, water and abrasion obtained with the 1960 wiring harness more than doubles wiring harness life.

- **Certified Reliability with Ford's submerged-type electric fuel pump!** Dynamometer tests of engines with submerged-type electric fuel pump and conventional mechanical type showed that vapor lock was non-existent with Ford's electric pumps at temperatures up to 200°, whereas incipient vapor lock with mechanical pump resulted in a power loss of 9% at an underhood temperature of 200°.

Test results like these plus the experience of satisfied users are important but that is not all. For 1960, the Super Duty line has been broadened to provide even more flexibility in power train options. Get the facts from your Ford Dealer!

FORD TRUCKS COST LESS

LESS TO OWN . . . LESS TO RUN . . . BUILT TO LAST LONGER, TOO!

For more facts, use Request Card at page 18 and circle No. 307

Diving for salvage construction operations

■ "Underwater Work, A Manual of Scuba Commercial, Salvage and Construction Operations," by John E. Cayford, is designed for those Scuba and shallow-water divers who have had experience in underwater work or who plan to enter the business on a full or part-time basis.

Some of the chapters discuss the principles of diving; diving safety; underwater construction, repairs, pipe laying, cutting, welding, demolition, and blasting; and photomicrography. Pictures and diagrams abound in the manual.

The $5 book may be purchased from the Cornell Maritime Press, Cambridge, Md.

A substantial part of structure work on a highway job near Battle Creek, Mich., is handled as a winter job. The Lorain 800 is placing concrete for the bottom slab of a double 8×8-foot box culvert that will carry a small creek under the embankment.

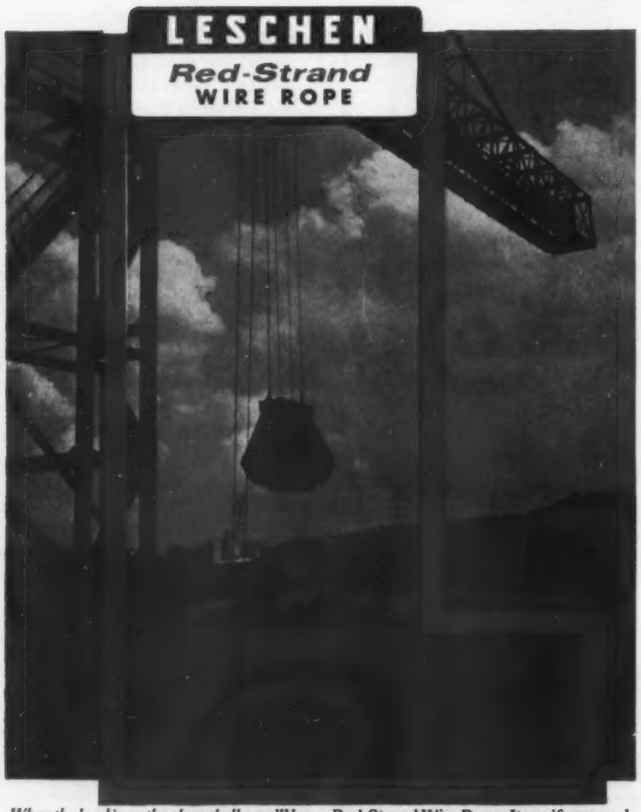
Construction team building bridges and box culverts on Michigan Interstate gas

WINTER WORK

Steam goes up from the 70-degree concrete dumped from the Gar-Bro 2-yard bucket to the base slab of the culvert. Twelve inches of straw covered with tarps is used to protect the freshly placed concrete.

when the going gets rough-

give 'em "L"



When the load is on the clam shell, you'll be glad you rigged with *Leschen*—the wire rope that's the same top quality in every foot of every reel. At Leschen there are new machines with exclusive new continuous-flow technique. Try Leschen Red-Strand Wire Rope. Its uniform quality makes your operation safer, your replacement time farther in the future.

Leschen Wire Rope Division,
H. K. Porter Company, Inc.,
St. Louis 12, Missouri.

LESCHEN WIRE PORTER ROPE DIVISION

H.K. PORTER COMPANY, INC.

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For more facts, use Request Card at page 18 and circle No. 308

SHOOTING FOR DRILLING RECORDS...

A modified v-cut breaking into a 6½-in. dia. burn hole was used. Brunner & Lay carbide 1¾" H Rok-Bits were used in the smaller machines and 3-in. H-90 Rok-Bits on the burn holes. Request NEW bulletin 359-12.

... better use Brunner & Lay Rok-Bits

RECORD TUNNEL DRIVING AT MAMMOTH POOL POWER PROJECT PROVES IT

Project personnel include: Boyd C. Paulson, project manager (above); Steve E. Wilmoth, general supt.; Paddy O'Dowd, Jack Robertson, and O. "Heavy" Holman, tunnel supts.; Utah Const. Co.; Harold Barber and Neville S. Long, engineers, Southern California Edison Co.

Solid blue granite doesn't slow Brunner & Lay carbide Rok-Bits. In driving the 8-mi. Mammoth Pool power tunnel, the Utah Construction Company's crews set a hard-rock record of drilling 390 ft. of the 20-ft. dia. horseshoe tunnel in six 24-hr. days. Brunner & Lay Rok-Bits were used 100%.

Whether out to set drilling records, or simply to improve your footage, Rok-Bits give you the best kind of start. For details, call your Brunner & Lay dealer, or our nearest plant. Brunner & Lay, Inc., 9300 King St., Franklin Park, Ill. *77 progressive years.* Plants and conversion shops: Albuquerque, Asheville, Birmingham, Dallas, Denver, Dorchester (Boston), Long Island City, Los Angeles, Philadelphia, Portland, Sacramento, Seattle, Yardley (Spokane), Lachine, P.Q., Vancouver, B.C.

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Standard or ROPE thread • MOIL POINTS, CLAY SPADES, ASPHALT CUTTERS, etc.

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ed-hot production ice-cold weather

Workmen with Cal-Tie and Ideal wire reels set reinforcing steel for the walls of the double 8×8-foot box culvert. Straw protects the base slab. In the background is a portion of the wellpoint system that lowered water in the excavation by 8 feet.

Carpenters secure the Cell-U-Form insulation to a form panel for a bridge pier by nailing the ears of the 1-foot-wide strips to the studs.

In spite of severe cold, construction crews chalked up a good production record while working on the structures on an interstate highway contract near Battle Creek, Mich.

During January and the first half of February, the 45 men on the payroll batched and placed an average of 675 cubic yards of concrete each week. They were building bridge substructures and big twin box culverts.

The general contractor, L. A. Davidson, Lansing, Mich., was able to maintain this production because of good field management and many years' experience in winter construction.

Insulated forms

Concrete was placed in insulated forms in temperatures down to 5 below zero. Aggregates and water were heated at the batch plant. Forms and reinforcing steel were heated with hot-air blowers to bring their temperature up above the freezing point. Straw and canvas protected the exposed surface of the concrete.

According to project manager Bob Nimms, there are actually some advantages to working through the winter. "Our best men stay with us in the winter," he says. "Most of these old hands can produce with little supervision. During the summer, we have many times as many men working for us—with half the experience.

"One thing that I've found helpful in keeping production up is a weekly meeting of the several superintendents on the job. On Monday morning, we get together and plan what we expect to accomplish during that week. We plan how to shuffle the equipment around so that it's available when it's needed. The meetings also give each supervisor a goal to shoot for. It promotes healthy competition among the supervisors and their crews."

(Continued on next page)

miller

FIVE IN ONE FIREBALL

Other Miller welders in this series include:

DA-300-L BIG RIG
Four-in-One:
arc welder; DC arc welder; kW AC power plant; 1 KW DC while welding

D-250-L ROUSTABOUT
Three-in-One:
welder; 10 KW AC power kW DC while welding

D-250-W ROUGHNECK
Two-in-One:
welder; 1 KW DC while welding

Here's what makes this Miller model the "Five-in-One":
1. AC welder for metallic arc welding
2. DC welder for metallic arc welding
3. AC or DC welder for TIG welding
4. A 10 KW, 115/230v single phase 60 cycle power plant
5. 1 KW of DC while welding

The DAH-350-L Fireball, driven by Hercules 32 hp engine, is another Miller FIRST, offers both a-c and d-c for metallic arc or TIG welding with three separate a-c and d-c amperage ranges for each.

There's continuous high frequency for a-c TIG welding with choice of "start only" or constant high frequency for d-c TIG work.

Standard equipment includes built-in high frequency stabilizer, polarity switch, power supply for water coolant system, and automatic inert gas control panel with solenoid valve and post flow timer. Trailers are available for welder only or for welder with coolant system and gas cylinders.

SPECIFICATIONS

	Metallic Arc	Tungsten Arc
WELDING RANGE	35-100 Amps AC	35- 75 Amps AC
	65-160 Amps AC	65-160 Amps AC
	110-400 Amps AC	150-375 Amps AC
	35- 80 Amps DC	35-100 Amps DC
	75-175 Amps DC	85-225 Amps DC
	125-350 Amps DC	170-375 Amps DC
RATED OUTPUT	250 Amps Tungsten Arc, 100% Duty Cycle DC	
	300 Amps Tungsten Arc, 100% Duty Cycle AC	
CURRENT ADJUSTMENT STEPS	Infinite	
MAXIMUM O.C.V.	72 Volts DC	
	80 Volts AC	
1 KW DC AUXILIARY POWER	115 Volts	
AC GENERATOR OUTPUT	10 KW	
OUTPUT VOLTAGE	115/230 Volt, 1 Phase, 60 Cycle	

Complete specifications on these welders will be sent promptly upon request.

miller ELECTRIC MANUFACTURING COMPANY, INC., APPLETON, WISCONSIN
250 West 57th St. New York 19, N.Y. • Distributed in Canada by Canadian Liquid Air Co. Ltd. Montreal

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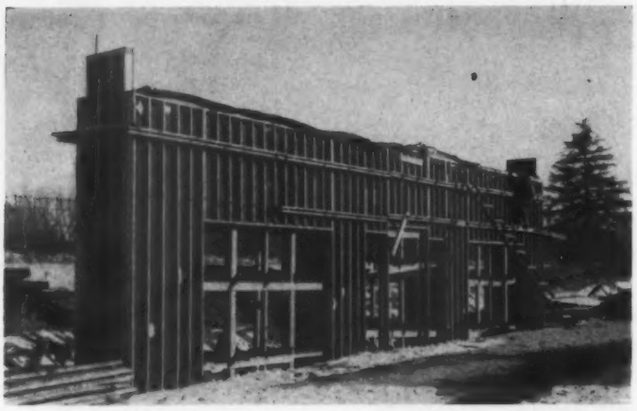


Pier forms are protected with Cell-U-Form insulation, which is made by Wood Conversion Co., St. Paul, Minn. Columns and cap were formed as a unit, but concrete was placed separately for them. Some of the wales have been stripped from this form.

(*Continued from preceding page*)

Big contract

Last January, L. A. Davidson had a good-sized project to get under way. The $3.8 million contract included the grading, paving, and structures on a 6.8-mile section of relocated U. S. 12 south of Battle Creek. This interstate highway will become a part of the expressway route between Detroit and Chicago. The segment is expected to be opened to traffic by the end of next month.

Davidson subbed the dirt work to W. M. Muehlenbeck of Saginaw and Maclean Construction Co., Lansing. (See page 43.) During the winter months, Davidson's crews built three large twin box culverts and completed the substructure work on the five reinforced-concrete bridges on the contract. This schedule made it possible for deck work on the bridges to be done during the warmer weather. Four of the bridges are of arched T-beam design; the fifth is a flat T-beam.

Box culverts

The contractor applied his winter construction techniques to building the two twin 8×8-foot box culverts and the one twin 6×6-foot box culvert. Often during the excavation, a headache ball, handled by a crane, had to be used to break through the frost. Only then was it possible to work a dragline or backhoe to excavate for the culvert.

Plywood forms, backed by 2 inches of insulation, protected the concrete. The 1-foot-wide strips of Cell-U-Form were nailed between the studs. The insulation contained two 1-inch layers of wood fiber insulation enclosed in asphalt-impregnated paper. The bottom layer remained watertight, even if the covering of the top layer was punctured. Where tie rods penetrated the forms, and both layers of the insulation had to be punctured, forms were protected with wood washers. With proper handling, the insulated forms could be re-used 4 times. The surface of the concrete was protected with a 12-inch layer of straw covered with canvas.

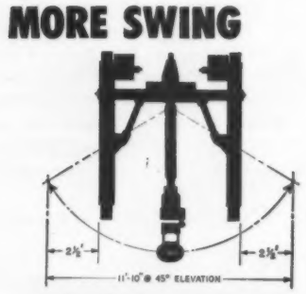
Equipment for highway job

- Lima 703 motor crane
- Lorain 800 crawler
- Bucyrus-Erie 22-B backhoe
- P&H 8-ton motor crane
- Northwest 25 crawler
- International TD-14
- Allis-Chalmers HD-5
- Butler batchers
- Dutton 60-hp steam boiler
- 4 Smith 5-yard mixers on Reo trucks
- 4 Ford pickups with Motorola 2-way radios
- Moretrench wellpoint system
- Cell-U-Form form insulation

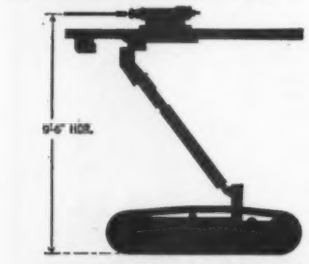
Although the state highway department does not hold the contractor to a minimum air temperature for concrete placement, it does require that the temperature of the forms and the steel be brought up to at least 35 degrees. The inspector also require that the temperature of the concrete at the batch plant be between 50 and 85 degrees.

On one of the twin box culverts excessive ground water made it necessary to install a wellpoint system. The Moretrench system, which encircled the excavation, lowered the water table about 8 feet, so that work could be done in the dry. The system required two Fairbanks-Morse 10-inch pumps driven by GMC 60-hp diesel engines.

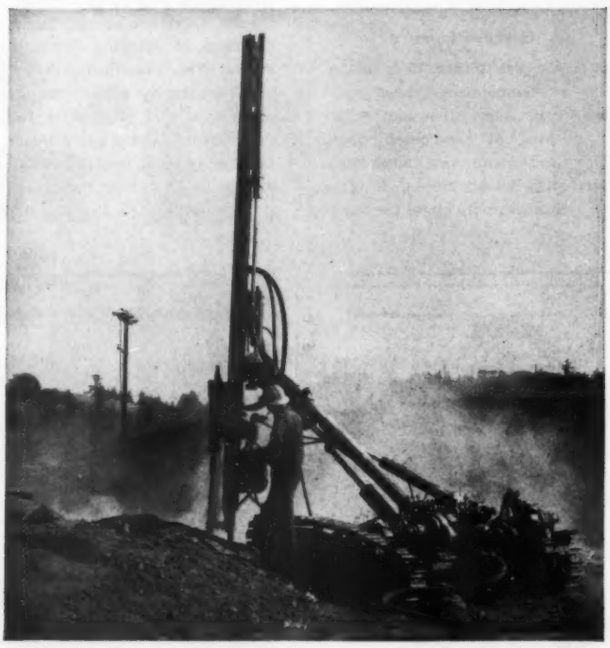
Heated concrete for the structures was supplied by the contractor's



MORE SWING



...MORE REACH



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TIME TO TALK TIME-SAVING

Gardner-Denver believes there's no substitute for men—it has been our philosophy of growth for 100 years. Your Gardner-Denver construction equipment specialist has helped many uncover ways to speed the pace . . . lower drilling costs. He's a good man to know. Get in touch with him soon.

Swings 11'10" . . . 2½' over both tracks Now drill more hole from one position . . . drill over a ledge from either side. Feed swings 11'10" at 45° elevation . . . moves to 2½' outside of each track with balanced stability.

Reaches to 9'6" height—for horizontal drilling Get better spacing of horizontal holes . . . reach to 9'6" for high breast holes.

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Saves time . . . steps All controls conveniently located. Drilling and positioning controls grouped at the front of rig to save steps, setup and drilling time.

Pulls tight steel Powerful Gardner-Denver 5-cylinder radial air motor enables your driller to put the right pressure on the bit in all drilling situations . . . provides necessary pulling power to bring tight steel out of the hole.

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Drills fast, clean hole Gardner-Denver's line of powerful rock drills is most complete—six hard-hitting models to choose from.

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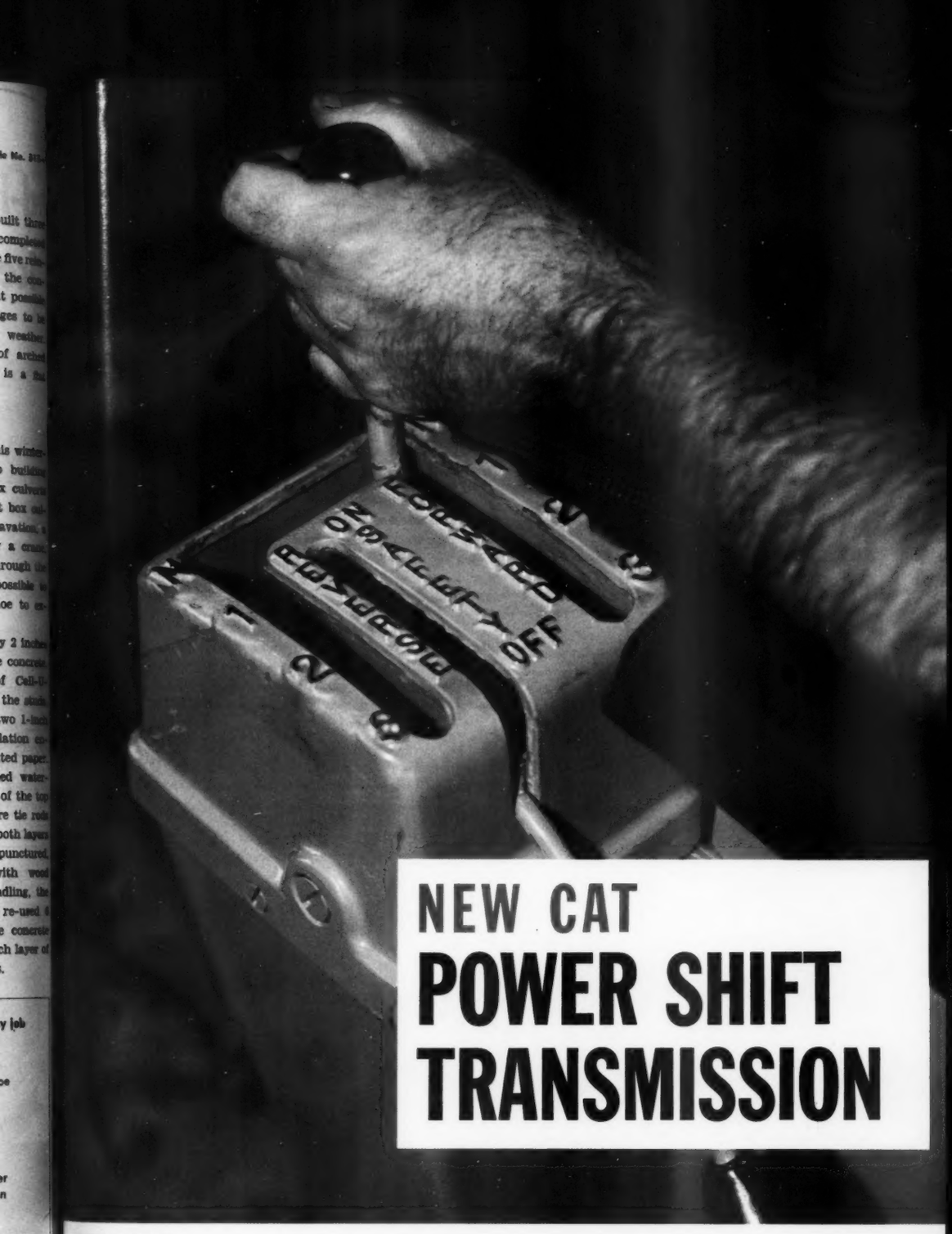


NEW CAT POWER SHIFT TRANSMISSION

CATERPILLAR'S **No. 1** PROJECT

PAYS OFF FOR YOU AGAIN! A multimillion-dollar research program—to meet the continuing challenge of the greatest construction era in history with the most productive earthmoving machines ever developed.

NEW POWER SHIFT TRANSMISSION for CAT D9 and D8 TRACTORS

Shifts on-the-go under full load in a split-second! ▪ Changes speed, reverses direction with finger-tip control lever—and no clutching!

The wraps are off—it's ready. After many years of research and on-the-job testing, Caterpillar now offers a revolutionary new transmission option for Cat D9 and D8 Tractors—power shift. The most recent Caterpillar new product development, this new transmission—with an exclusive design—provides production highs never before possible with a track-type tractor. Here's why:

1. It combines for the *first* time the flexibility and anti-stall features of torque converter with the operating snap of direct drive. And because of its direct drive characteristics, it is more efficient than other power shift designs.

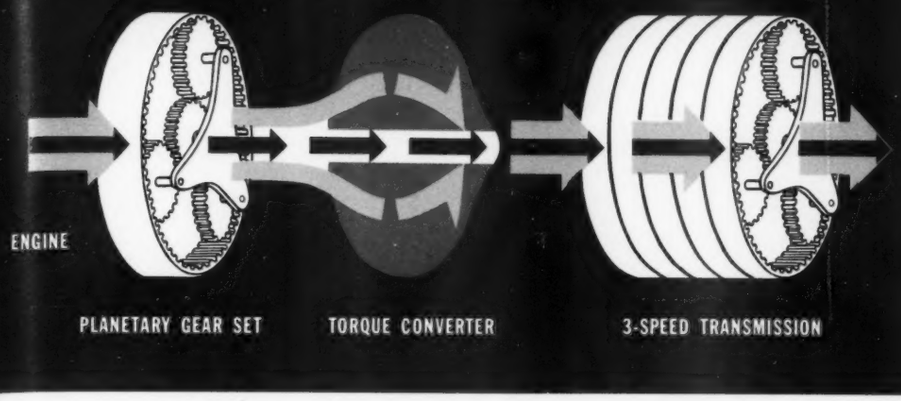
2. With one control lever and no clutching, it reverses direction . . . changes speed . . . smoothly . . . under full load . . . in a fraction of a second!

Talk about productivity—Cat power shift delivers in a big way. Split-second, on-the-go shifts give plenty of power in the highest gear possible. Shifting is so easy the operator just naturally gets more work out of the tractor. What's more, he gets it on the toughest, most demanding track-type jobs. Cat power shift design is strong and rugged for the *heaviest earthmoving duty.*

Get the details about this power shift from your Caterpillar Dealer. Ask for a demonstration—see for yourself how it steps up production. Remember, you also have your choice of direct drive or torque converter in the D9 or D8. Whatever the application, Caterpillar has the most productive machine for it!

HIGHER PRODUCTION PUSHLOADING: *Power is quickly, easily adjusted to meet the demand. Shifting to higher gear boosts scraper out of cut at higher speed, increases production. Speedy reverse quickly positions machine for next push.*

CAT POWER SHIFT TRANSMISSION



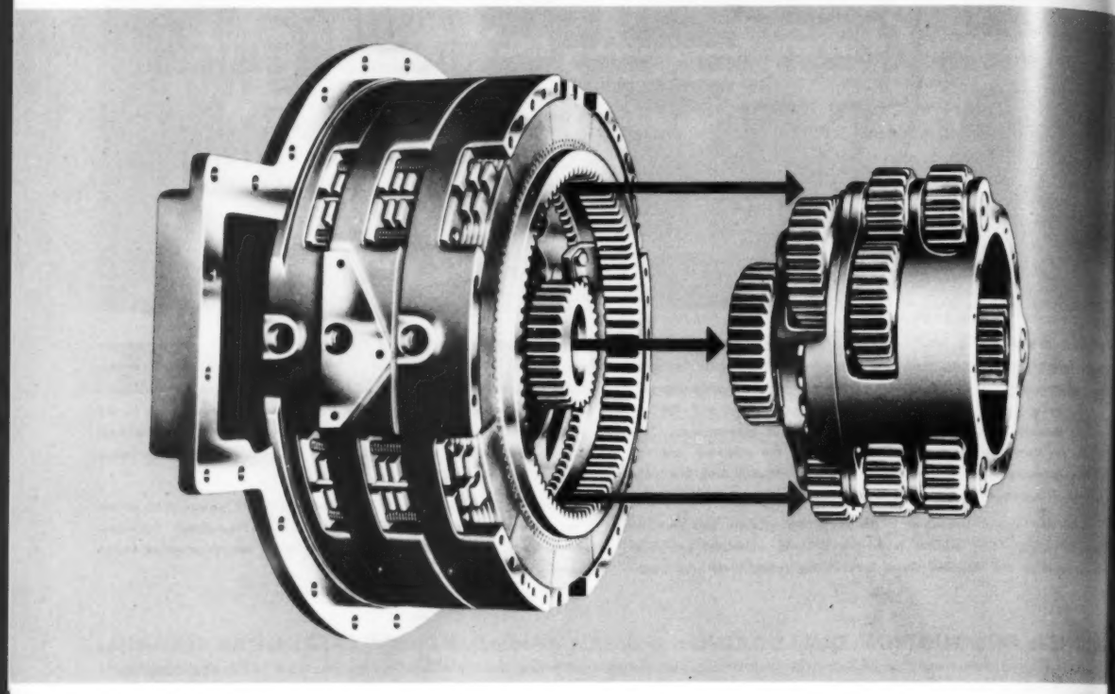
BASIC DESIGN: Total power ➡ is transmitted from the engine to a planetary gear arrangement mounted in the engine flywheel. The planetary divides and directs the total power—part goes through a direct drive shaft straight to the transmission ➡ and the remainder through a torque converter ➡ to the transmission. This enables the Cat power shift to combine some of the efficiency and the positive operating feel of direct drive with the anti-stall and flexibility features of torque converter drive.

Power shift control is mounted to the left of the operator (see previous page). One selector lever (black knob) eliminates gearshift, forward-reverse and flywheel clutch levers. The safety lever (red knob) prevents accidental transmission engagement. The selector lever moves in a "U" path to various positions. To the left are three reverse speeds. To the right, three forward speeds. To change speed, simply move lever to the required position. To change travel direction, move lever to the opposite side. Changing speed and direction are as easy as that—without clutching—and changes can be made while the machine is in motion under full load without loss of power.

Pioneered by Caterpillar, this uniquely designed power shift is engineered and built for heavy earthmoving service—it's rugged! The transmission itself weighs over one ton! And its clean, unit construction design makes it easy to service, when required.

HIGHER PRODUCTION BULLDOZING: *As the material builds up, Cat power shift permits split-second, on-the-go shifting. There's no forward surge when the load is dropped. Instant reversing further slashes cycle time on a bulldozing assignment.*

ONE TON OF RUGGEDNESS



—CAT POWER SHIFT TRANSMISSION!

You're looking at a portion of the components that make up the new Cat power shift transmission. This rugged transmission, weighing over a ton, is designed and built specifically by Caterpillar for its giant tractors. Every component is constructed for long-lived service. Selected alloy steel insures performance that stands up under the toughest conditions. Equally important, Cat power shift comes to you thoroughly tested by exacting design and demanding field work in the heaviest earthmoving duty. You can be sure that it will stay on the job.

In fact, every feature of D9 and D8 Tractors is specifically designed and built to keep these machines working *profitably* for you. For example, lifetime lubricated track rollers never require further lubrication until rebuilding. They feature Caterpillar-developed, *exclusive* floating-ring seals that assure constant, positive sealing. These seals—plus a rugged design featuring bushing-type bearings and deep hardenable alloy rims—plus 2½ million test hours—make Caterpillar rollers ready for the toughest jobs.

Lifetime lubricated rollers and idlers—one of many other rugged features of Cat D9 and D8 Tractors.

In short, nothing has been overlooked to make these modern, heavy-duty machines the most practical and most productive in their class in the field.

For complete facts on the new Cat power shift see your Caterpillar Dealer. He's ready to explain in detail how the Cat power shift works, or to demonstrate its ruggedness . . . its ease of operation . . . its productivity. Name the date—he'll demonstrate!

Caterpillar Tractor Co., Peoria, Ill.; San Francisco, Calif., U.S.A.

CATERPILLAR

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DIESEL ENGINES • TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

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PROVED IN THE FIELD

A Lima 30-ton truck crane swings a Gar-Bro 1-yard bucket to the insulated deck forms for another culvert. Between the stringers of the forms are 2-inch-thick strips of Cell-U-Form, a wood fiber enclosed in asphalt-impregnated paper.

batch plant. Aggregate and sand were heated by jetting live steam into the base of the stockpiles. Steam, generated by a Dutton 60-hp vertical boiler, was also piped to the bins in the plant and the water tank. The Butler single cement batcher dropped batches of unheated cement into the Smith mixers mounted on Reo trucks.

Pier forms are insulated

Insulated forms were also used to protect the concrete in the bridge piers. The forms were of a simple design and contained relatively few wood panels.

The four columns and continuous cap of each pier were formed as a unit. The plywood forms of the box-shaped columns extended up to the top of the cap. A single panel between the columns formed the side of the cap.

Although both cap and columns were formed as a unit, concrete was placed first for the four columns. The cap was completed in two separate pours.

Forms were stripped when the concrete had obtained half of its 28-day strength. This time, which was dependent on the outside temperature, was calculated from a chart.

Personnel

For L. A. Davidson, Robert Nimms is job superintendent. He is assisted by superintendents Dick Noblet and Vern Lott. For the Michigan State Highway Department, Ross La Vanway is project engineer for the structures, and Jim Johnson is project engineer for the grading and paving.

THE END

Bulletin lists standard hoist specifications

The Hoist Manufacturers Association, Inc., has issued the first of a series of recommended minimum standard hoist specifications. This booklet, concerned with electric wire-rope hoists, defines and spells out the recommended minimums of hoist construction and outlines basic information that should accompany any inquiry sent to a hoist manufacturer or distributor.

Copies of the bulletin are available from member companies of the HMA or from association offices at 1 Thomas Circle, Washington 5, D. C.

Frost effects in soil, on pavement surfaces

■ The Highway Research Board, 2101 Constitution Ave., Washington 25, D. C., has issued Bulletin 218, "Frost Effects in Soils and on Pavement Surfaces." The bulletin contains four papers.

Frost action and load-carrying capacity evaluation by deflection profiles is the subject of the first paper, which describes the experimental use of a Benkelman beam with a Helmer recorder attached as a means of measuring the changes in load-carrying capacity of flexible pavements that occur as a result of frost action. It also gives the results of an attempt to correlate these values with those obtained by use of the plate-bearing test. The second paper presents a theory to explain rhythmic ice banding, which produces frost heave in soil; and the third paper discusses icing on pavements as demonstrated by actual conditions in the New York Metropolitan area in January, 1956.

The concluding paper, on frost action and railroad maintenance in the Labrador Peninsula, also reports the results obtained from a number of ground temperature installations.

Graphs, tables, diagrams, and formulas amply illustrate the bulletin, which may be purchased for $1 from the HRB.

ENGINEERS AND CONTRACTORS:

Ellicott 10" "DRAGON" building turnpike in Connecticut.

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are vital to road construction

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"DRAGON" Model Hydraulic Dredges, built in size ranges from 8 to 20 inches for every dredging requirement, are the most economical means available for moving water-bound solids. Designed and manufactured by the Ellicott Machine Corporation, the oldest and largest exclusive builder of dredges and dredging equipment in the world. For more information, write for full, descriptive literature.

4326

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Successors to the floating dredge business of the Bucyrus-Erie Co. and the American Steel Dredge Co. Complete engineering sales and repair parts service.

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TWO NEW MARLOW LIGHTWEIGHT UTILITY PUMPS

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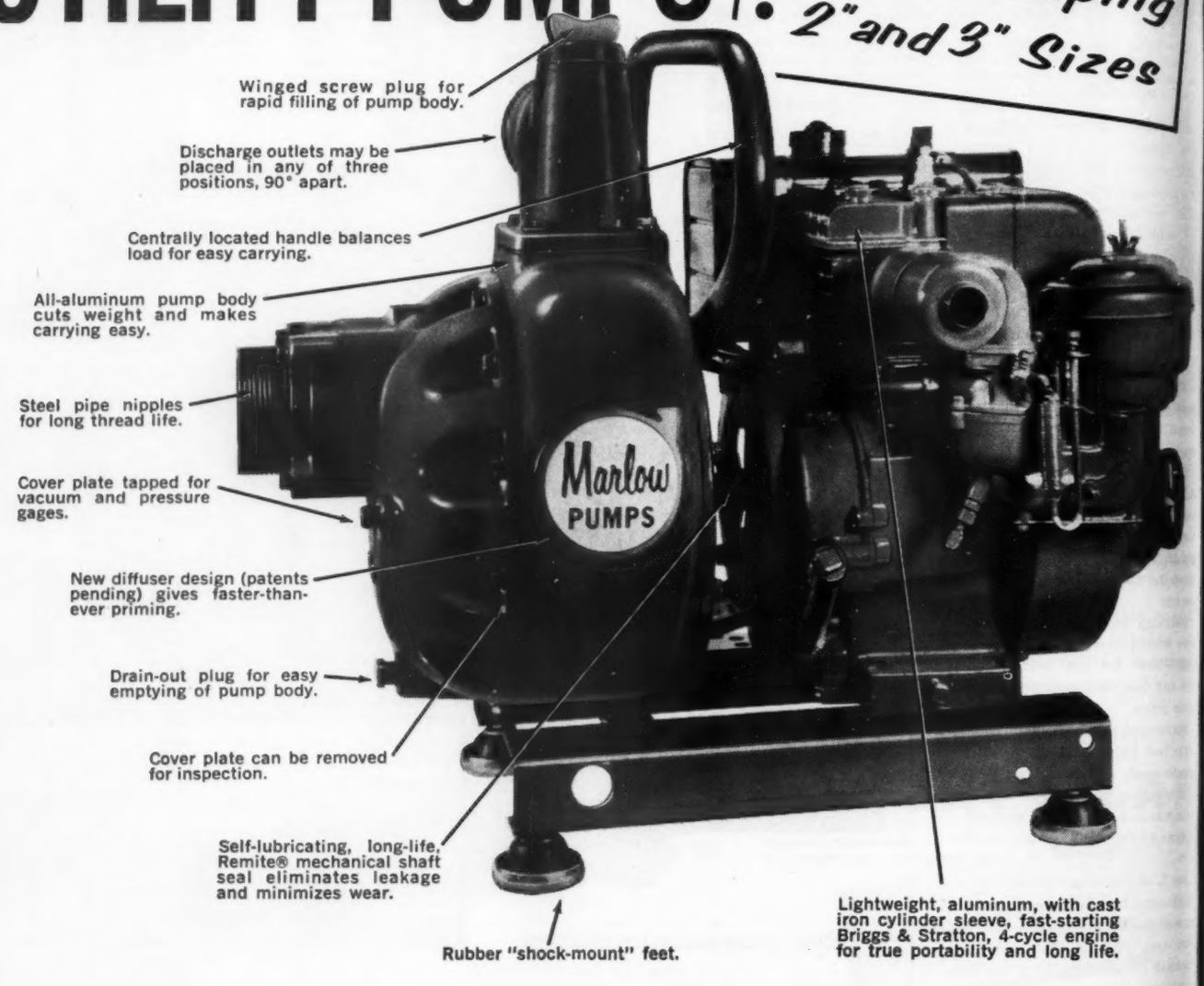
- Better Pumping
- 2" and 3" Sizes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Lightweight, aluminum, with cast iron cylinder sleeve, fast-starting Briggs & Stratton, 4-cycle engine for true portability and long life.
Marlow PUMPS

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Generally accepted accounting principles for contractors

Part 1: The basis for recording income

This is the first of four installments on accounting principles generally accepted by the accounting profession for use by contractors. The material, which is being published in booklet form by the American Institute of Certified Public Accountants, 270 Madison Ave., New York 16, N. Y., represents the thinking of the Institute's committee on accounting procedures.

The principal problems and questions relating to accounting for construction contractors revolve around the recording of income on contracts. Such contracts may be of short or long duration and are basically of two types: fixed-price and cost-plus.

The basis for recording income on contracts of short duration poses few problems. In the case of such contracts, profits are ordinarily recognized when the facilities are substantially completed and accepted. This accounting procedure has stood the test of time and should not be departed from except for cogent reasons.

The basis for recording income on construction-type contracts of long duration or term does pose special accounting problems because the work often extends over several accounting periods. The work is commonly financed to a considerable extent with advances from the contractor's client, and billings sometimes run ahead of the actual incurrence of costs by the contractor. The work of the contractor is usually performed "on the job," and the contractor has rights of lien rather than legal title. Thus the contractor's accumulated and incurred costs are more in the nature of receivables from his client than inventories.

Fixed-price contracts

Consider, first, comments and interpretations of the Institute committee's accounting recommendations relative to long-term contracts wherein a contractor agrees to a fixed contract price which may result in either a gain or a loss on the completion of the contract. They apply to such long-term projects as the construction of a bridge, a large ship, a section of highway, an office building or apartment house, a dam or canal, a manufacturing plant, a sewer system, or a subway.

Two generally accepted methods of accounting are suggested by the Institute committee for long-term fixed-price contracts:

1. The percentage-of-completion method—"preferable *when estimates of costs to complete* and extent of progress toward completion of long-term contracts *are reasonably dependable.*"

2. The completed-contract method —"preferable *when lack of dependable estimates or inherent hazards cause forecasts* to be doubtful."

The word "preferable" was used deliberately in these recommendations to indicate that, while there is a presumption in favor of the percentage-of-completion method where reasonably dependable estimates can be made, there is similarly a presumption in favor of the completed-contract method when dependable estimates are lacking.

It would, of course, be preferable in some circumstances to use one method for certain contracts and another for other contracts. It might appear that a contractor who employs

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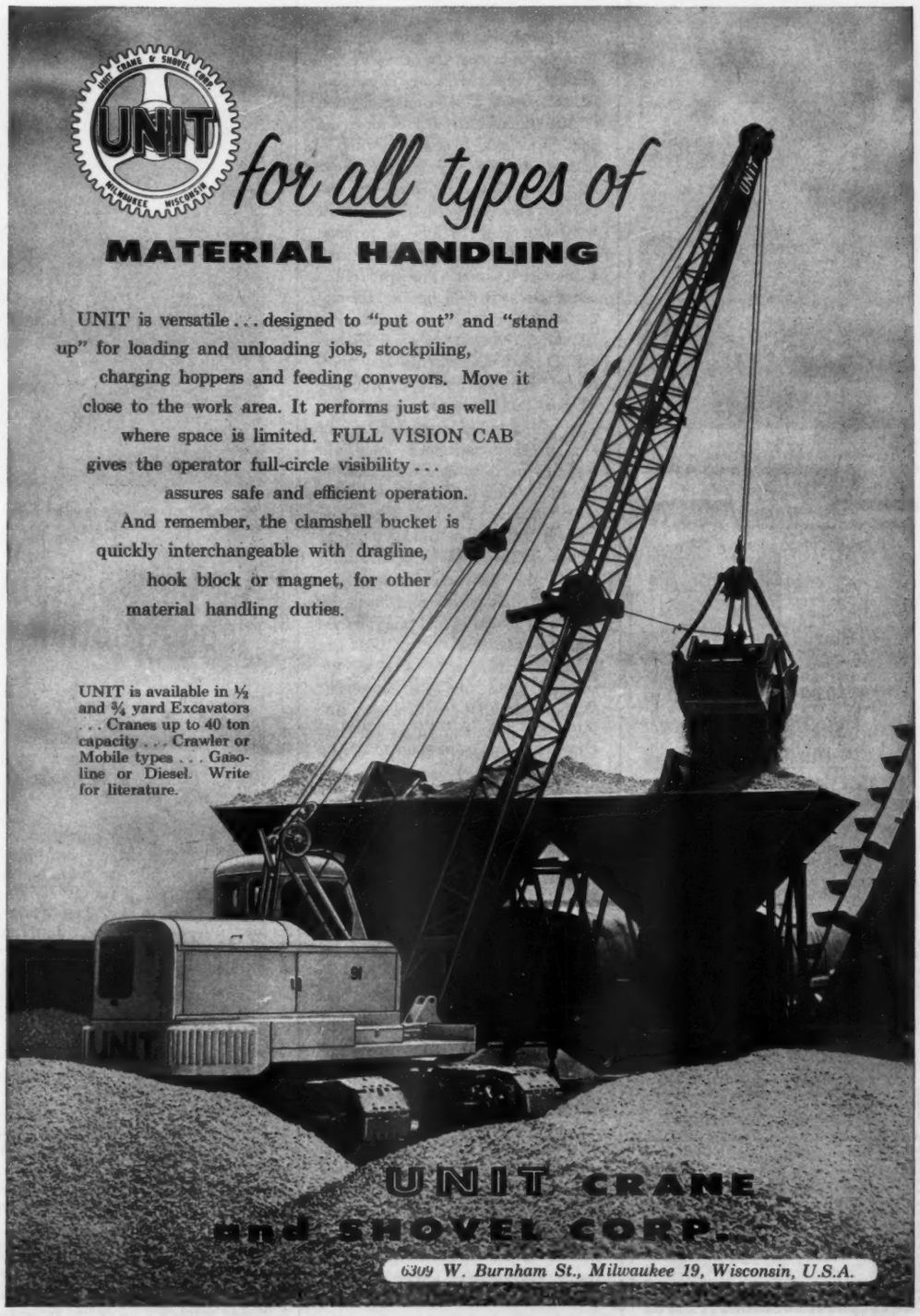
UNIT CRANE & SHOVEL CORP.
UNIT
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MATERIAL HANDLING
UNIT is versatile . . . designed to "put out" and "stand up" for loading and unloading jobs, stockpiling, charging hoppers and feeding conveyors. Move it close to the work area. It performs just as well where space is limited. FULL VISION CAB gives the operator full-circle visibility . . . assures safe and efficient operation. And remember, the clamshell bucket is quickly interchangeable with dragline, hook block or magnet, for other material handling duties.
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A8-5023

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such a combination of accounting methods is being inconsistent. This, however, is not the case. Consistency in application lies in according the same accounting treatment to the same set of conditions from one accounting period to another. The selection of a method should therefore be governed by a set of ground rules, consistently followed. For example, a shipbuilding concern might consistently use the percentage-of-completion method in accounting for the construction of new vessels which normally require approximately two years to build, whereas it would employ the completed-contract method for survey and other repair work which usually requires only a few days or months to complete.

It will be observed the first quotation refers only to "estimates of costs." It is sometimes suggested that billings constitute a possible basis for the recognition of realized income on partially completed contracts. Such billings may, however, have no real relationship to performance under a contract. In some instances, knowingly or unknowingly, the contractor's client permits the earlier billings to be made in amounts which are excessive when compared with the work actually performed. This is a means of providing working capital for the contractor and the arrangement is referred to as an "unbalanced bid or contract." In other instances, to protect the owner, the "on account" billings may be purposely kept below the costs incurred, and thus below the amount due for the work performed. It is more common, however, to protect the owner by "retainage," which is usually 10 per cent of each billing, payable on completion of the contract. It will be observed that *generally billings are not a suitable basis for income or profit allocation*. By using costs of comparable work previously performed, a contractor may be able to arrange billings under a new contract in such a manner that an appropriate income allocation will result. This situation is obviously not one of mere chance but in itself does not repudiate the fact that billings may have no real relationship to performance, whereas costs ordinarily do.

It is sometimes suggested, say in relation to a particular long-term contract or to a contractor having numerous long-term contracts, that the selection of the accounting method will give a totally different picture of the financial position and results of operations. However, a close reading of the comments on the selection of an accounting method indicates that the two methods are mutually exclusive for one specific contract. It is only with the benefit of hindsight that one can say, following completion of a five-year contract, "had it been recorded on the percentage-of-completion method instead of the completed-contract method, the year's profit would have been $10,000 instead of zero."

Percentage-of-completion method

The generally preferred method for recording income on long-term contracts is the percentage-of-completion method, which recognizes income on work as a contract progresses. This method has the advantage of periodically recognizing income on a current basis rather than irregularly as contracts are completed. It also reflects the status of uncompleted contracts. The major disadvantage of this method is its necessary dependence on estimates of ultimate costs which are subject to uncertainties.

The Institute's committee on accounting procedure recommends that income to be recognized in a contractor's accounts be either:

(a) that percentage of estimated total income that *incurred costs* to date *bear to estimated total costs* after giving effect to estimates of costs to complete *based upon most recent information, or*

(b) that percentage of estimated total income that may be indicated by *such other measure of progress* toward completion as may be appropriate *having due regard to work performed.*

In applying the first of these methods, it is recognized that, since work performed is the primary basis for income allocation, certain costs may be disregarded as a measure of performance in the early stages of a contract for the purposes of determining income allocation. The statement relative to "incurred costs to date" might be qualified by saying that *costs*, as here used, *might exclude*, especially *during the early stages* of a contract, *all or a portion* of the cost *of such items as materials and subcontracts* if it appears that *such an exclusion would result in a more meaningful* periodic *allocation of income.*

Covers several situations

This qualification takes into account situations in which substantial quantities of materials may have been accumulated on a job site but not used, or situations in which engineering or architectural fees have been incurred, which may, for example, represent 15 per cent of total estimated costs when, in terms of work performance, the contract was only 5 per cent completed. In these

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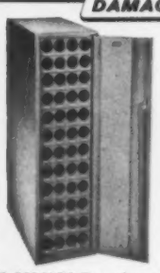

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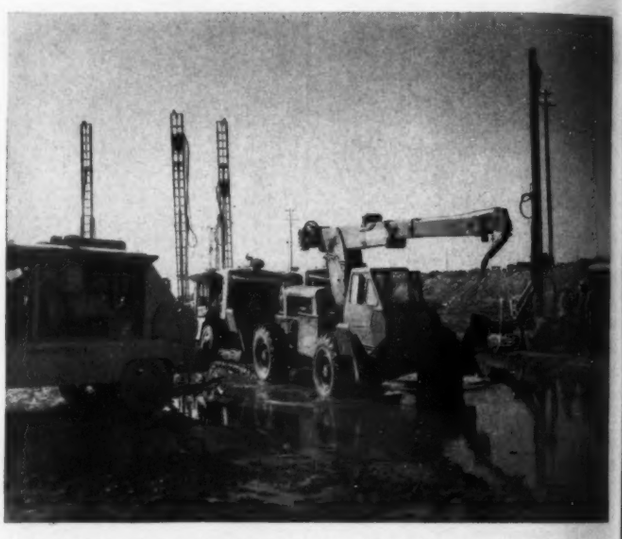

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Austin-Western hydraulic crane... construction project workhorse

"We haven't got a single rig on the job that is more all-around useful and hardworking than the Austin-Western hydraulic crane." That's what Fred Sebastian, project manager for Gull and De Felice Construction Co., Niagara Falls, N.Y., says about the A-W crane.

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circumstances, income recognized as allocable to the period should be related fully to only 5 per cent of the total, and not to the extent of 15 per cent.

Under alternative (b), "such other measure of progress" is intended to recognize the possibility of using other factors as measures of percentage of completion where they, more appropriately than costs incurred to date, measure work performed. Such measures may be, for example, cubic yards of excavation for foundation contractors; or cubic yards of concrete or asphalt laid for highway contractors; or engineering or architectural estimates of percentage of completion. Where a more meaningful allocation of income would result, it is, of course, permissible and even more appropriate for one contractor to use different methods of estimating work performed on several different types of contracts.

Completed-contract method

The second of the two generally accepted methods, the completed-contract method, recognizes income only when a contract is completed, or substantially so. During the period of construction, billings and costs are accumulated, but no profits or income are recorded before the substantial completion of the work. A contract may be regarded as substantially completed if *remaining costs are not significant in amount.*

This method's principal advantage is that it is based on results as finally determined, rather than on estimates for unperformed work which may involve unforeseen costs and possible losses. Its disadvantage, of course, is that it does not reflect current performance when the period of a contract extends through more than one accounting period. Under the latter circumstances, the method may result in an irregular recognition of income, and in some situations (for example, single proprietorships or partnerships) it may, through an irregular recognition of taxable income, subject the individuals concerned to greater income tax liabilities.

Note again that the completed-contract method states income is to be recognized when a "contract is completed, *or substantially so.*" The latter words had twofold significance to the Institute committee. First, seriously misleading results could occur as, for example, if a contractor was not permitted to recognize income under this method at, say, his December year-end and was forced to defer the recording until January or, worse still, until months later when the project was declared legally completed in accordance with local ordinances and codes. Secondly, the committee properly desired to discourage a deliberate postponement of the recording of income on a contract by deferring the performance of some minor part of the work.

It is common practice not to accumulate as contract costs general and administrative expenses and similar general expenditures sometimes described as overhead or indirect expenses. Such expenses are usually treated as "period costs" (i.e., current expenses). Under the percentage-of-completion method, such difficulty is rarely encountered because there is periodic recognition of income from which such items can be deducted. However, this may not be the case when the completed-contract method is employed. The Institute committee therefore stated that "when the completed-contract method is used, it may be appropriate to allocate general and administrative expenses to contract costs rather than periodic income. This may result in a better matching of costs and revenues than would result from treating such expenses as period costs, particularly in years when no contracts were completed."

The three words "may be appropriate" are used deliberately since a contractor who employs the completed-contract method may be engaged in numerous projects and it may be preferable for him to charge those expenses to periodic income as they are incurred as no material distortion of net income would occur. However, if there is only one contract (or just a few contracts), and no income (or an abnormally small amount of income) is recordable on the completion of contracts in a specific period, seriously misleading results might be shown if general and administrative expenses were expensed as incurred in each accounting period. The election by the contractor to allocate general and administrative expenses to contract costs, like the selection of one of the two methods of accounting for contracts, should be governed by a set of ground rules, consistently followed.

However, the committee cautions that "In any case there should be no excessive deferring of overhead costs, such as might occur if total overhead were assigned to abnormally few or abnormally small contracts in process."

Here the committee apparently had in mind that, when construction volume was at a low point, only a reasonably allocable or normal amount of overhead costs should be assigned to contracts in process. The remaining general and administrative or overhead costs should then be shown as period expenses, even though net losses were thereby produced.

(Continued next month)

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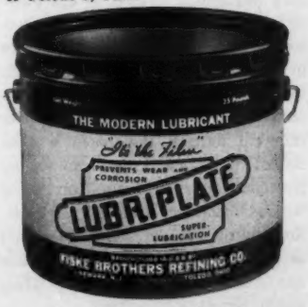

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Avoid legal pitfalls

Taxable status of wet concrete and asphalt

THE PROBLEM: *Plaintiff was a supplier of ready-mix concrete and asphaltic concrete to contractors. He did not in any way participate in the building of the forms, their location at the job site, or their removal after the concrete had hardened. All concrete finishing or other handling, when required, was done by the contractor. The only employee of plaintiff customarily at the job site was the truck driver, whose sole duty was to spot the truck and place the concrete into the forms as directed by the contractor. The procedure was the same for hot-mix sold by the plaintiff. The total mixing operation, however, took place in plaintiff's plant, and thereafter the hot-mix was transported by dump truck to the job site. Any spreading, leveling, or compacting was done by the contractor and not by the plaintiff. Was the supplier liable for sales tax on materials furnished?*

THE ANSWER: Yes. (Hayward Building Material Co. v. State Board of Equalization, 330 Pac. 2d 855, decided by the California District Court of Appeal, Third District.)

Plaintiff had paid sales taxes under protest and unsuccessfully sued to secure a refund. The court rejected argument that plaintiff's business was that of subcontractor, within the meaning of exempting provisions of the sales tax law. The court stressed the fact that intention by plaintiff and its contractor patrons that their dealings were to be regarded as sales of material was indicated by the use of ordinary sales orders and accounts.

Contractor's liability

THE PROBLEM: *A highway contracting firm sublet excavation work. The subcontractor neglected to maintain flares at an excavation, and a motorist was injured when his car fell into it at night. Was the firm jointly liable with the subcontractor for the injury?*

THE ANSWER: Yes. (Cage v. Creed, 308 S. W. 2d 78, decided by the Texas Court of Civil Appeals, Waco.)

The court noted a general rule of law that if an owner or a prime contractor engages an independent contractor to perform certain work, leaving to the latter full control over performance of that work, the owner is not liable to an outsider for injury negligently caused by the owner's contractor, and a prime contractor is not liable for the negligence of his subcontractor. But there is an exception to that rule to the effect that, if the particular work involves inherent danger, the owner will be liable for negligent performance by his contractor, and the contractor will be liable for negligent performance by his subcontractor. The court said that excavations in public roads are "inherently dangerous" when public travel is permitted.

Intoxicated employee was discharged

THE PROBLEM: *After two weeks' employment, a bulldozer operator was discharged because he appeared for work intoxicated and drank intoxicants on his job. Was he entitled to unemployment benefits under Pennsylvania Social Security law?*

THE ANSWER: No. (Hassen v. Unemployment Compensation Board of Review, 150 Atl. 2d 158, decided by the Pennsylvania Supreme Court.)

The court decided: intoxication, which will disqualify employee from benefits under the Unemployment Compensation Law, comprehends not only the easily recognized manifestations of excessive drinking but also any abnormal mental or physical condition from overindulgence which deprives an employee of the clearness of intellect or muscular control necessary for proper performance of his work.

Individual liability of firm members

THE PROBLEM: *The individual defendants in this case were doing business as a partnership in 1952. In April, 1953, under direction of their attorney, they did those things which caused them to believe that a corporation had been formed. Thereafter they continued to do business as "Web Construction Co.," believing that that was the name of their incorporated business. But articles of organization were not filed until February 8, 1955, with the corporation being named "Web Construction Co., Inc." The individual defendants did not know the name and continued to do business as "Web Construction Co." Plaintiff furnished work and material to either partnership, individual defendants, or corporation from the end of November, 1954, until December, 1956, and delivery slips from plaintiff read "Webb Const. Co.," "Webb Const.," "Web Const.," "Webb Construction Co.," "Webb," "Webb Job," and "Webb Estate."*

Were the individual defendants personally liable on the bills?

THE ANSWER: No. (Georgetown

"...never any choice bu
for concrete form

PHOTOGRAPH BY EZRA STOLLER

Sand & Gravel Co. v. Burr, 157 N.E. 2d 413, decided by the Massachusetts Supreme Judicial Court.)

Dumping dredged spoil was a trespass

THE PROBLEM: *A government contract for dredging on an intracoastal waterway designated places for dumping spoil and dredged material. In dumping at unauthorized places, the contractor caused damage to freshwater supply and irrigation facilities on private land held under lease for rice production. Was the contractor exempt from liability on a theory that the damage was in effect committed by the government?*

THE ANSWER: No. (Bauer-Smith Dredging Co. v. Tully, 305 S. W. 2d 805, decided by the Texas Court of Civil Appeals, Beaumont.)

The contractor would be immune from liability for dumping at places covered by an easement granted to the government and designated in the contract documents. Dumping at other places by the contractor was its own private and wrongful act.

The court referred to a similar decision by the United States Court of Appeals, Fourth Circuit, to the effect that another dredging contractor was not immune from liability for damage caused in performance of a government contract. (281 Fed. 981.) In that case the court said that the contractor might not be liable for injuries which were the natural and necessary result of carrying out its contract with the government, but there was no exemption from liability for obstructing a stream by improper disposal of dredged material.

Edited by A. L. H. STREET
Attorney-at-Law

These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

Fatal mistake in bid

THE PROBLEM: *Plaintiff bid $144,800 on a California school district building job. The next low bid was $158,370 and others ran as high as $177,758. On opening the bids, a mistake was suspected and the basis of plaintiff's bid was rechecked without a mistake being found. Contract was entered into, but before work started, plaintiff discovered that in extending detailed figures on which the bid was based, plumbing cost was listed as $1,200 instead of $12,000. The bid should have been $155,600—more than $2,000 less than the next bid. Through the board's architect plaintiff was notified to proceed and that the board would see that he suffered no loss. When the work was completed, the board paid the amount bid and expressed willingness to pay $10,800 more if it could do so legally. Plaintiff sued to have the contract so revamped as to permit that to be done. The trial judge decided that this was proper. Did he err?*

THE ANSWER: Yes. (Paterson v. Board of Trustees, Montecito Union School District, 321 Pac. 2d 825, decided by the California District Court of Appeal, Second District.)

Substance of the higher court's reasoning was that by entering into a contract—when it was still suspected that a mistake had been made in computing the bid, instead of withdrawing the bid, and by proceeding with the work under his contract—plaintiff waived right to collect more than the contract price. The board would have violated the state law governing bidding had it paid the $10,800 in the circumstances.

Equipment-rental contract

THE PROBLEM: *A federal-building construction contract specified a lump-sum price and set up no separate price basis covering excavation. The contractor accepted an equipment owner's bid to furnish needed excavating equipment on a unit, hourly basis. No reference was made to the prime contract nor to the plans and specifications of that contract. The prime contract provided for an increase or decrease in the contract price on modification of the work to be done due to encountering unexpected subsurface conditions. The government allowed the contractor additional pay for excavation of rock unexpectedly encountered. Did the amount awarded the contractor under an adjustment of the price affect the equipment lessor's right to payment according to the terms of the lease contract?*

THE ANSWER: No. (United States v. Montgomery, 152 Fed. Supp. 309, decided by the United States District Court, Middle District of Pennsylvania.)

The court distinguished this case from one in which a painting subcontract called for work conforming to the plans and specifications of a prime contract at a specified total unit price. The United States Court of Appeals, Fifth Circuit, decided that the subcontractor was bound by the government engineer's decision as to what work was required under the prime contract. (Lanehart v. United States, 226 Fed. 2d 359.)

(Continued on next page)

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s Charles Spero, job superintendent, Euclid Contracting Corporation

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ARCHITECT: Frank Lloyd Wright
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New York City

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avoid legal pitfalls

(*Continued from preceding page*)

Damages for delay

THE PROBLEM: *A contract to build four preliminary sedimentation tanks and four sludge digestion tanks involved two units. It was agreed that the contractor would pay $100 per day for each day's delay in completing either unit. Was that a penalty so excessive as to be unenforceable?*

THE ANSWER: No. (Progressive Builders v. District of Columbia, 258 Fed. 2d 431, decided by the United States Court of Appeals, District of Columbia.)

The court said that the contractor misinterpreted the contract as providing a $100 penalty for each of four units of construction.

The court also decided: the contractor was debarred from claiming, in avoidance of the penalty, that delay was caused by the District, because the contractor had failed to give notice of the delay within ten days after the commencement thereof, as provided by the contract. And compliance with a condition in the contract—that an appeal be taken to contracting officer by the contractor if his claim under the contract were disputed—was essential and could not be excused on the ground that it was a foregone conclusion that the contracting officer would decide against him.

Minimum-wage clauses in public contracts

THE PROBLEM: *Contracts for public work for a city required the contractor to use only first-class labor and to pay wages not less than those fixed by "customary and traditional collective bargaining groups". The contractor signed the agreement under advice of lawyers that the requirement was illegal and therefore would not be binding. Was he bound?*

THE ANSWER: Yes. (Glassman v. Philadelphia, 9 Dist. & Co. Reports, Pa., 495, decided by Judge Levinthal of the Philadelphia Court of Common Pleas.)

The decision rejected argument that the clause violated a city charter requirement that public contract be

For more facts on Insert, circle No. 3[illegible]

let to the "lowest responsible bidder." The lowest bidder may not be responsible. To insure work by competent workmen the city could require payment of wages commonly paid such workmen locally.

Nor did the contract imply conspiracy with labor unions, for it did not require employment of union labor. But it was proper for the city authorities to consider that payment of wages conforming to union scales would tend to guard against disputes and interruptions that might result from strikes and walkouts.

Related contracts

THE PROBLEM: *A city contracted for the purchase of pipe and other supplies to be installed as a water supply system, and separately contracted with another contractor to make the installation. The supplier did not deliver the pipe within the time agreed. Was the supplier liable to the contractor for damage?*

THE ANSWER: No. (American Pipe & Construction Co. v. Harbor Construction Co., 317 Pac. 2d 521, decided by the Washington Supreme Court.)

The court gave these reasons for the decision: (1) the city's contract with the contractor specified that it was not to be liable for delays caused by other contractors; (2) contrary to the contractor's claim, the city's contract with the supplier and the contract with the contractor were independent of each other. The contractor could not rely upon the obligations assumed by the supplier to the city. The court said, in effect, that even though the two contracts could be read together for the purpose of interpreting the installation contract, they could not be read together for the purpose of giving the contractor a damage claim against the supplier for indirect damage caused by the latter's breach of its contract with the city.

Mistake in address

THE PROBLEM: *John Traff was a contractor doing an unincorporated business in his own name. Defendant addressed a subcontract bid to the "John Traff Construction Co.," and it was received by and accepted by Traff. Was defendant bound by the bid, despite his claim that its acceptance was made by a party to whom it was not addressed?*

THE ANSWER: Yes. (Traff v. Fabro, 84 N. E. 2d 874, decided by the Illinois Appellate Court, First District.)

The court reasoned: During the negotiations between the parties, after plaintiff accepted defendant's proposal, no objection was ever raised by defendant as to the identity of plaintiff. But the court fully recognized that where one reasonably supposes he is contracting with one person he cannot have another person thrust upon him, especially when he reposes particular trust in the credit, character, etc., of the first person.

Low Cost Pre-dewatering by FLYGT PUMPS Whips Severe Water Intrusion for Eight Contractors on $23,180,000 Sewer Job

In a $23,180,000 bond issue race against time, contractors are rushing completion of additions to the Orange County, California, sewer system. The nation's fastest growing county — already over-taxed by rocket-powered increases in population, commerce and industry — is suffering from inadequate sanitation facilities, slamming the door shut on new building.

Eight contractors in the 19-mile Miller-Holder Trunk Sewer part of the mammoth project are winning their race despite severe ground water intrusion conditions that could have slowed work to a crawl and run costs to astronomical highs. Key to the success of these separate, but simultaneous contracts is an efficient, economical pre-dewatering system developed jointly by Gridley Construction Co. and Stance Engineers. Featuring over 40 Flygt Submersible Dewatering Pumps, the pre-dewatering system has drained and kept dry ditches along the project right-of-way at substantial savings over other dewatering methods. Typical of contractor comments on the system:

"This system really does the job," declares Pete Barrett on J. S. Barrett Co.'s $2,667,727 contract for installation of 5½ miles of 78-inch line. *"You just drop Flygt Pumps in the hole, turn them on and forget them. They keep the ditch dry at realistic cost with none of the trouble normally experienced with suction-type pumps."*

"These Flygt Pumps give you a chance to go home and sleep at night," says N. A. Artukovich on his company's $1,846,870 contract for placement of more than 5 miles of 51-to 63-inch pipe. *"The Flygts require little attention and keep the pipe and ditch dry despite continuous intrusion conditions. The pumps handle a lot of solids."*

"We are handling all of the water on our job with Flygt Pumps," states C. B. "Jiggs" Pelland on Steve Rados' $1,547,860 contract to place 4 miles of 69-inch line. *"We turn them on when we shut down for the day and let them run all night without a worry. They handle a lot of water and keep the placed pipe water-free."*

'Our Flygt Pumps are in continuous operation keeping jacking pits and other excavations dry," remarks George Dakovich on his $1,363,-107 contract to install more than 4 miles of 45- and 51-inch pipe. *"We have had dry working conditions from the first at low cost and with little attention."*

If you have dewatering problems Flygt Pumps are available in several sizes and are adaptable to practically any dewatering application. They are fully submersible and need no priming. Electric-Powered for easy, low cost operation, they can run continuously and without attention even in sludge, sandy and muddy water. Designed and built for tough applications and rough conditions, the heavy-duty Flygts are resistant to salt water, easy to handle and quick and easy to service. FLYGT SUBMERSIBLE ELECTRIC PUMPS range in size from ½"-85 GPM capacity to 8"-3000 GPM capacity. Head capacities range up to 210 feet. Higher heads available with FLYGT Pumps in tandem. Weights range from 70 to 1200 pounds. Ask for free literature today.

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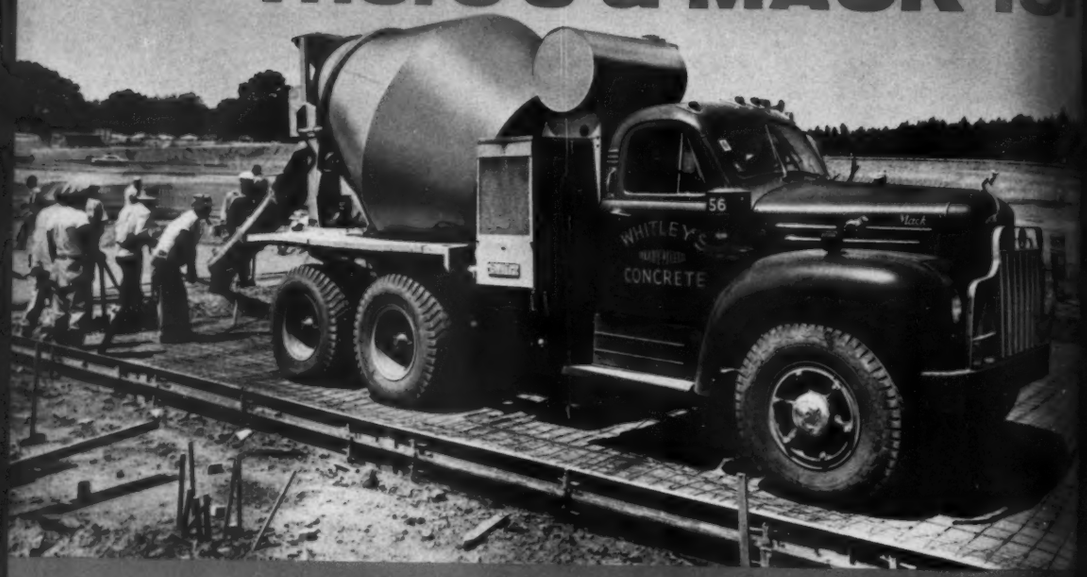
Mack Balanced Design is achieved by engineering and building components which work together with maximum efficiency. Only Mack can offer Balanced Design because only Mack makes all its own major components... makes them to standards of ruggedness and precision accomplished nowhere else. Mack Balanced Design results in a truck whose engine, clutch, transmission, axles and suspensions all work in harmony to produce an uncommonly smooth, powerful, responsive unit.

There's a MACK for ev



Mack B-40 Series—5 to 10 yards as rear dumpers, 5½ to 7 as mixers

They combine big-truck power, capacity and stamina with small-truck agility and economy for service as dumpers, tractors, mixers and platform trucks. 150 hp Mack Magnadyne gasoline engine. Wide choice of Mack transmissions up to 20-speed units, in on-highway and off-highway versions (depending on model). Choice of heavy-duty axles and frames that offer standard and optional reinforcement. Option of power steering. Six-wheelers offer Mack Balanced Bogie with Power Divider. All-wheel-drive units as well

every construction job

Mack B-60 Series—6 to 12 yards as rear dumpers, 5½ to 8 as mixers

These trucks have hung up records for economy and long mileage life on every kind of job—as dumpers, mixers, tractors and platform trucks. The "workhorse of the industry", they're powered with Mack Thermodyne® gasoline or diesel engines from 170 to 205 hp. Wide choice of Mack transmissions up to 10-speed units, in both on-highway and off-highway versions (depending on model). Choice of heavy-duty axles as well as frames that offer standard and optional reinforcement. Option of power steering. Six-wheelers feature exclusive Mack Balanced Bogie with Power Divider.

Mack B-80 Series—7 to 14 yards as rear dumpers, 7½ to 10 as mixers

Here's Mack profit-power personified! Big, rugged B-80's can be custom-assembled to meet your needs exactly: as tractors for heavy-duty hauling of platform or dump trailers...or as truck chassis for dumper, mixer or utility service. Wide option of power and gear ratios. Available in 4- and 6-wheel models including six-wheel-drive units. Powerful, durable braking power.

Up to 232 hp Mack gasoline or 205 hp Mack Thermodyne diesel engines; up to 320 hp stock diesels. Choice of Mack transmissions including Mack 20-speed Quadruplex. Mack Dual Reduction rear axles and—on 6 wheelers—Mack Balanced Bogie with Power Divider. Mack front-wheel drive axle on six-wheel-drive models. Option of power steering.

Mack "L" Series—15-25 ton end-dumpers to 50-ton bottom dumper

The Macks in the "L" Series—LRX 15-ton, LR18X 18-ton, LVX 22½-ton, LV25X 25-ton and the giant LRVX tractor which pulls 50-ton bottom dumper—are designed with the power and strength to handle the biggest construction jobs. They shrug off the relentless pounding of big-yardage shovels, and are loaded with features for top performance, long life and freedom from downtime.

Rugged power trains offer up to 450 hp diesel engines... Mack overgeared transmissions or torque converters and Mack Planidrive rear axles... powerful air brakes of latest design handle steepest descents... maneuverability characteristics of smaller vehicles – thanks to ideal power steering and air-assisted clutch.

For end-dumper capacities up to 40 tons, where maximum flotation is required, a full line of tandem rear axle Macks is available.

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means components integrated for longest prime of life.

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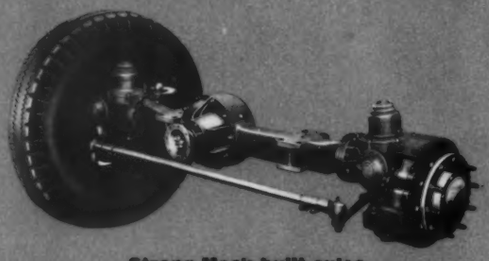
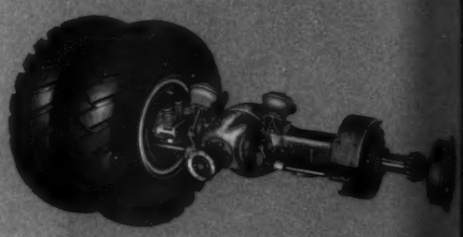


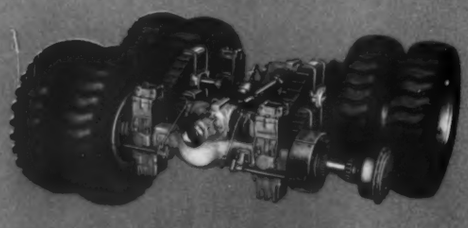
Strong Mack-built axles

Mack's drop-forged I-beam front axles are made super strong for long, trouble-free service. Extensive use of heat-treated steels for crucial parts means minimum maintenance. And Mack's exclusive front-drive axle (shown above) for all-wheel-drive trucks offers the greatest ground clearance and strength of any made—with all parts fully enclosed.



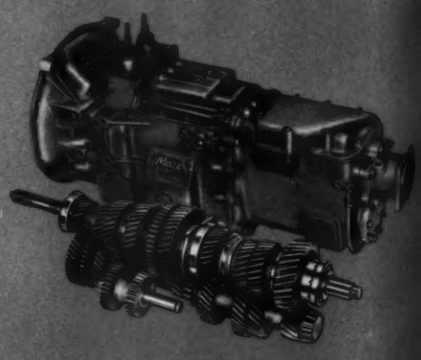
Durable Mack-built 2-wheel rear axles

Mack's two-wheel, rear-axle assemblies have an unmatched reputation for service under strenuous conditions. Dual Reduction carrier and Mack's famous Planidrive gear reduction at the wheel hubs provide the smooth distribution of power vital to top truck performance.



High-traction Mack-built Balanced Bogies

Macks perform where other trucks bog down—in mud, loose gravel or sand—thanks to Mack's exclusive Balanced Bogie with Power Divider—a 4-wheel drive, tandem rear-axle assembly with an inter-axle differential that distributes the power to wheels with greater traction. To achieve maximum road clearance in larger units, Mack Planidrive final reduction gears in all 4 hubs eliminate the need for outsized carriers and low-slung differentials.



Long-lived Mack-built transmissions

Service records prove that Mack transmissions—like this 20-speed Quadruplex—stand up to heavy-duty hauling far longer and need less attention than any others—thanks to the use of the finest gear metals known...to painstaking precision manufacture...and to exclusive Tetrapoid gear design that gives maximum strength, longer life and smoother action. Five- to twenty-speed units, each with ideal ratio steps.

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Convention Calendar

October 6-9 Ohio Short Course on Roadside Development
Course, State Office Bldg. and Ohio Union of Ohio State University, Columbus, Ohio. Wilbur J. Garmhausen, Chief Landscape Architect, Ohio Department of Highways, State Office Bldg., Columbus 15, Ohio.

October 11-16 American Association of State Highway Officials
Meeting, Statler-Hilton Hotel, Boston, Mass. A. E. Johnson, executive secretary, AASHO, 917 National Press Bldg., Washington 4, D. C.

October 11-16 American Society for Testing Materials
Third Pacific Area National Meeting, Sheraton-Palace Hotel, San Francisco, Calif. ASTM, 1916 Race St., Philadelphia 3, Pa.

October 19-22 American Bridge, Tunnel and Turnpike Association
Meeting, Hotel Muehlebach, Kansas City, Mo. John Allyn Stearns, executive secretary, ABTTA, Northcourt Bldg., White Plains, N. Y.

October 19-23 American Society of Civil Engineers
Annual Convention, Hotel Statler, Washington, D. C. Don P. Reynolds, assistant to the secretary, ASCE, 33 W. 39th St., New York 18, N. Y.

October 19-23 National Safety Council
Forty-seventh National Congress and Exposition, Conrad Hilton Hotel, Chicago, Ill. R. L. Forney, secretary, NSC, 425 N. Michigan Ave., Chicago 11, Ill.

October 20-22 National Association of Corrosion Engineers
North Central Region Conference, Cleveland, Ohio. T. J. Hull, executive secretary, NACE, 1061 M & M Bldg., Houston 2, Texas.

October 25-28 National Lubricating Grease Institute
Meeting, Roosevelt Hotel, New Orleans, La. T. W. H. Miller, general manager, NLGI, 4638 J. C. Nichols Parkway, Kansas City 12, Mo.

October 26-28 National Highway Conference for County Engineers and Officials
Seventh Annual Conference, Leamington Hotel, Minneapolis, Minn., sponsored by the County and Local Roads Division of the American Road Builders' Association. ARBA, World Center Bldg., Washington 6, D. C.

October 29-30 National Slag Association
Forty-second Annual Meeting, Boca Raton Hotel and Club, Boca Raton, Fla. K. W. Bauman, managing director, NSA, 813 Perpetual Bldg., Washington 4, D. C.

November 2-5 American Concrete Institute
Twelfth Regional Meeting, Continental Hilton and Del Prado Hotels, Mexico City, Mexico. William A. Maples, secretary-treasurer, ACI, P. O. Box 4754, Detroit 19, Mich.

November 2-6 Prestressed Concrete Institute
Fifth Annual Convention, Deauville Hotel, Miami Beach, Fla. Martin P. Korn, executive secretary, PCI, 425 N. E. Fifth St., Boca Raton, Fla.

November 5-6 American Concrete Pressure Pipe Association
Meeting, The Fairmont, San Francisco, Calif. Mrs. Marjorie L. Congleton, secretary to the managing director, ACPPA, 228 N. LaSalle St., Chicago 1, Ill.

November 16-20 Corrosion Short Course
Fourth Annual General Florida Conference, Key Biscayne Hotel, Miami, Fla., sponsored by the Miami Section of the National Association of Corrosion Engineers. T. J. Hull, executive secretary, NACE, 1061 M & M Bldg, Houston 2, Texas.

November 23-25 Southeastern Association of State Highway Officials
Meeting, Eden Roc Hotel, Miami Beach, Fla. Ralph Davis, secretary, SASHO, Florida State Road Department, Holland Bldg., Tallahassee, Fla.

November 30-December 3 American Institute of Steel Construction
Annual Meeting, Boca Raton Club, Boca Raton, Fla. L. A. Post, executive vice president, AISC, 101 Park Ave., New York 17, N. Y.

December 2-3 The Asphalt Institute
Annual Meeting, Shoreham Hotel, Washington, D. C. TAI, Asphalt Institute Building, University of Maryland, College Park, Md.

A DOUBLE-DUTY JOB IS DONE by this Payloader Model H-70 working on a gas main in downtown Chicago for the Peoples Gas Co. With a rated lift capacity of 5½ tons and a carry capacity of 3½ tons, the Hough unit loads trucks with broken concrete and backfills around the pipe with sand. Nash Bros. Construction Co. is relocating the 2,000-foot-long 24-inch main under the Northwest Superhighway.

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B.F.Goodrich ***Hi-Torque brakes***

For more facts, use Request Card at page 18 and circle No. 324

A contractor-adapted portable separation plant produces two sizes of material for Vega Dam near Grand Junction, Colo. The rig, named The Monster, has a Universal 16-bar wobble feeder with a 9-inch pitch and 3-inch spacing that turns out Zone 1 material to a Cedarapids conveyor feeding the Euclids that haul to the embankment. Oversize goes to a plate feeder that loads "Eucs" stockpiling the material for riprap. A Bucyrus-Erie 54-B feeds the plant.

Wobble feeder separates materials for earth dam

The monster—a mobile separation plant—has a tremendous appetite that can't quite be satisfied by a 2½-yard shovel working full time. It swallows bucketloads of pit-run material almost instantaneously, separates the soil from the rocks, and spews each out into separate haul rigs. The monster is not just an ordinary screening plant, for it has a wobble feeder instead of screens; furthermore, it is mounted on rubber tires and is self-propelled.

The mobile separation plant, nicknamed The Monster because of its ungainly appearance, was developed by C. F. Lytle, Inc., Sioux City, Iowa, around a Universal wobble feeder to produce two types of material required for Vega Dam northeast of Grand Junction, Colo. Lytle has the $1,707,145 contract with the U. S. Bureau of Reclamation to construct the earth-fill dam, which is the focal element of the bureau's Collbran Project.

To produce the required Zone I material for the impervious main embankment of the dam, the contractor must remove the oversize that constitutes some 15 to 20 per cent of the pit. The rock is being used for riprap on the upstream and downstream faces of the dam or stockpiled for future use. Although the specifications require removal of rocks over 5 inches in diameter from the Zone I material, the contractor chose to make the separation at 3 inches.

The borrow area supplying this material is located on the left bank downstream of the dam and within an average of 3,000 feet from the embankment. This was the best material available near the site, but even this material lies in a relatively shallow horizon, rarely over 40 feet in depth.

This condition made it necessary to use a large area for the borrow pit. When the job was planned, this factor introduced the problem of rehandling the materials at a stationary separation plant. Work on this problem led to the development of The Monster, which eliminates the rehandling operation.

Has wobble feeder

The Monster is a slightly smaller version of the stationary plant originally planned. Salvaged parts of an old bridge and a Euclid bottom-dump make it mobile.

A Bucyrus-Erie 54-B shovel with a 2½-yard bucket loads material from the pit face directly to a hopper at the top, which feeds the Universal wobble feeder. This 16-bar wobble feeder with 9-inch pitch and 3-inch spacing is the real heart of the machine. Its rotating oval-shaped bars rapidly pass the minus 3-inch material. This Zone I material falls to a Cedarapids 36-inch-wide and 37-foot-long belt conveyor set on a 12-degree pitch. A fleet of four 13-yard Euclid bottom-dumps takes heaping loads from the conveyor and delivers them to the dam embankment.

The oversize material feeds off the end of the wobble feeder into a Universal 42-inch × 12-foot plate feeder set at right angles to the belt conveyor. Two Euclid 22-ton end-dumps haul this oversize to the embankment.

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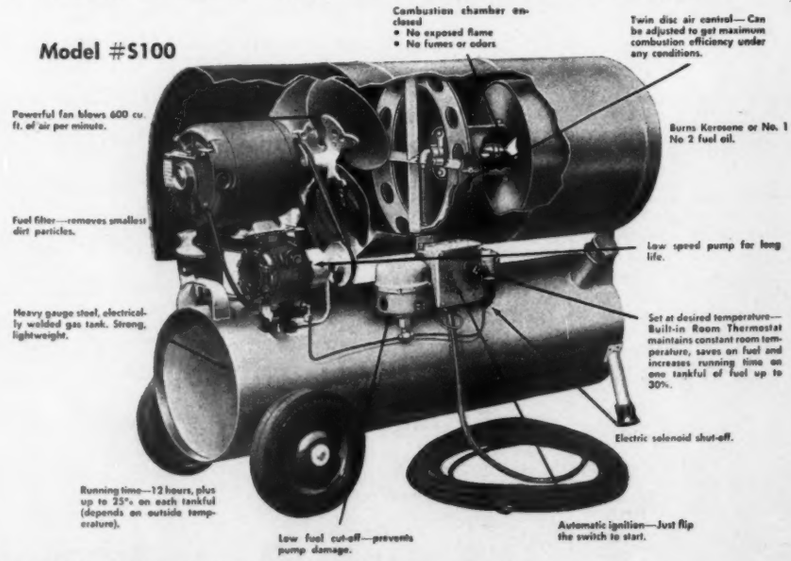
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Available in models from 100,000 to one million BTU/hr. To select the correct size heater for your job, write for FREE complete Heater Catalog 5815. STOW Manufacturing Co., Dept. K-1, 40 Shear St., Binghamton, N. Y.

For more facts, use Request Card at page 18 and circle No. 326

The Monster rides on a triangular subframe made of long 21-inch WF beams from a dismantled bridge. One corner of the frame is connected to a gooseneck from a salvaged Euclid bottom-dump. The gooseneck, in turn, is attached to a standard Euclid 4-wheel tractor. The two wheels carrying the rear portion of the frame are also from the salvaged "Euc".

er to stockpiles as desired. The large plate feeder runs only when there is a "Euc" in place waiting to load. Since it is large enough to hold five yards of rock while waiting for a truck, the plant can run steadily with a minimum number of rigs hauling the rock.

The framework on which the plant units are mounted is high enough so that the plate feeder delivers the rock directly into the body of a Euclid end-dump. The main part of the tower supporting the machinery is of conventional construction, but the subframe is unique.

A dismantled bridge from Sioux City supplied some long 21-inch WF beams that make up the triangular subframe. At the apex of the triangle, the beams are welded to the gooseneck from an old "Euc" bottom-dump. This gooseneck attaches to a Euclid 4-wheel tractor. The other two corners of the triangle are each carried on one of the rear wheels salvaged from the old bottom-dump. The tread between these rear wheels is about 22 feet, and the length from the gooseneck to the rear wheels is about 20 feet.

The several units of the plant are run by electricity supplied by a Caterpillar D17000 generator. The generator is mounted on a Ford F8 truck and is connected to the plant by 130 feet of cable.

In operation, the rigs are spread out in a line parallel to the face the shovel is excavating, with the generator truck in the lead. The shovel

(*Continued on next page*)

The plant is located along a steep canyonside so that the mixer can discharge directly into the Maxon 4-yard Dumpcrete on a Ford F8 truck. Bulk cement is handled in the Engineered Equipment Co. elevator and silo.

For more facts, circle No. 327→

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(Continued from preceding page)

Core material spread on the embankment is knocked down by a Cat D8 tractor-dozer that has a rear-mounted McCoy manipulator to help spread and scarify the earth. Compaction is handled by a Shovel Supply Co. 40,000-pound sheepsfoot roller pulled by a D8.

works with its tracks parallel to the face, taking as much of a cut as it can reach before the setup moves ahead.

Since The Monster can actually handle the material faster than it can be supplied by the 2½-yard shovel, the contractor planned to substitute a P&H Model 1055 with a 3½-yard bucket to speed the operation.

Building the embankment

Before embankment work could start, it was necessary to strip the topsoil and some other materials from the embankment foundation. This work, as well as the excavations for the outlet works and spillway, was done by the same Euclid scrapers that stripped the borrow-pit area. The scrapers also excavated two shallow cutoff trenches the length of the dam. These trenches are only 5 feet deep and are 15 feet wide at the bottom. The material below the topsoil was a very dense impervious stratum similar to the embankment material being used.

During the early phases of the job, the "Euc" bottom-dumps hauled the Zone I material about 3,000 feet to start the embankment at the bottom of the canyon. Part of the haul road had a 9 per cent downgrade, which dropped about 170 feet from the borrow pit to the bottom of the canyon. As the embankment rose, this drop became less.

As the "Eucs" dumped the material on the fill, a Caterpillar D8 tractor-dozer equipped with a rear-mounted McCoy manipulator bar knocked down the piles, and spread and scarified the material in preparation for the compaction unit. A Shovel Supply Co. 40,000-pound double-drum sheepsfoot roller pulled by another D8 handled the compaction. This is one of the job's three D8's equipped with turbocharger normalizer kits. These exhaust-driven turbochargers compensated for the loss of power at this 8,000-foot elevation, bringing the power of the rigs back to that at sea level.

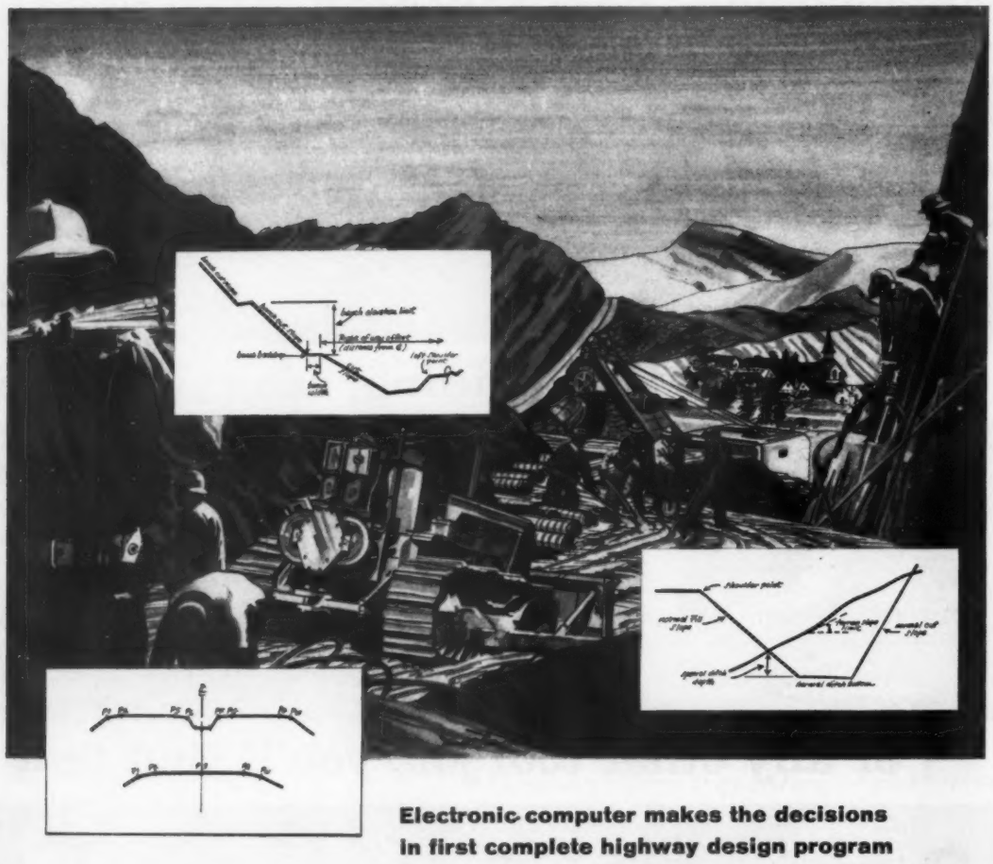
Ranch becomes construction camp

While all of the contractor's employees and USBR personnel on the Vega Dam project live at Collbran or other villages in the valley, the contractor took advantage of existing ranch buildings at the dam site in setting up construction-camp facilities. A grain shed and stable became the job warehouse. The rancher's barn was converted into a 2-bay shop for equipment repair. Two Prue-hauf parts trailers set up beside the old barn complete the shop. The ranch house itself was turned into a carpenter shop.

To augment the existing buildings, Lytle brought in two Mobile Office trailers to serve as the job offices. Electric power for all of the camp facilities is provided by a Caterpillar D13000 diesel generator set.

The material from the borrow pit contains nearly optimum water content for compaction; relatively little moisture has to be added. The Monster is equipped with a water spray on the discharge conveyor, but this has not been used. A "Euc" bottom-dump converted to a 4,000-gallon water wagon applies the needed moisture on the embankment.

Zone 2 material, a mixture of sand, gravel, and cobbles, is being obtained from an upstream pit where it is loaded and hauled by scrapers without being processed. Hauls for this



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LGP-30

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Royal Precision Corporation

Royal Precision is jointly owned by the Royal McBee and General Precision Equipment Corporations. LGP-30 sales and service are available coast-to-coast, in Canada and abroad through Royal McBee Data Processing offices. For complete specifications on the LGP-30 and all the facts on the new highway design program, contact your nearby Royal McBee Data Processing Representative, or write

ROYAL McBEE CORPORATION, data processing division, Port Chester, N. Y.

For more facts, use Request Card at page 18 and circle No. 328

◄ Plus 3-inch material from the borrow pit is dumped to a stockpile by a Euclid. The rock will be used as riprap on the upstream and downstream faces of the dam.

Chute walls and this curved intake structure are being formed with Economy panels. Note the relatively simple forming required to produce the curved surfaces. ►

material range up to 8,000 feet. This material provides filter zones and bedding for riprap.

When weather permits during the 5-month season—from about May 15 to October 15—two crews work 8 and 10 hours a day, six or seven days a week. The haul units usually work 8-hour days, six days a week; the separation unit operates an extra two hours per shift and sometimes works all day Sunday. Material separated during these extra work hours is stockpiled in the pit to provide an emergency supply that can be hauled to the embankment during any periods when The Monster is shut down for repairs or adjustments.

Since these work hours run well into the night, lighting is being provided by eight 21-kw Katolight generators with floodlight towers. The generators are powered by GM 2-71 diesel engines.

Vega Dam, scheduled for completion early next year, is not large, but the short working season at this high altitude keeps the contractor working at full speed during all of the available season.

The dam will control the flow of Plateau Creek and some of its tributaries to create a reservoir of 40,000 acre-feet. The structure will have a crest length of 2,035 feet and a maximum height above foundation of 154 feet. Total volume of earthwork is just over a million cubic yards.

Outlet works consist of a cut-and-cover conduit constructed along the left bank at the bottom of the canyon. An intake structure admits water to a 5-foot-diameter conduit leading to a gate chamber under the dam. From the gate chamber, an 8-foot horseshoe conduit leads through the dam to a stilling basin and the outlet channel, which is the first element of the canal that will eventually distribute the water along the south side of Plateau Valley. Inside the horseshoe conduit is a 51-inch-ID steel pipe to carry the water, leaving room for access to the gate chamber. The total outlet structure is 762 feet long.

The 8-foot horseshoe section was cast in forms originally used for a 9.5-foot horseshoe on Jamestown Dam in North Dakota. Forms for the 5-foot circular conduit were designed and built especially for this job. The outlet conduit had to be rushed to completion as one of the first elements of the job because it is used for diversion of the flows in the creek during the construction period.

(*Continued on next page*)

OLIVER

▲ The OC-4 is ideal for dozens of jobs. It works perfectly with dozers and many other money-making attachments. It really gets around because it has more power and the highest ground clearance in its class. And there's a choice of four track gauges to meet your needs: 31″, 42″, 60″ and 68″.

The compact design of the OC-46 allows it to maneuver in and out of tight spots with ease. Long, 46″-wide tracks guarantee stability and positive traction. Side arms are rigidly mounted to the subframe to absorb shock and stress. Low loader arm mount and high seat give full visibility at all times. The OC-46 has a high dump and a long reach. Speed range, 1½ to 5¼ m.p.h. ►

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The Oliver OC-4...*the "most-for-your-money" crawler in its power class*

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This "little giant" offers more weight, a higher drawbar pull, perfect balance and the easiest control found in any crawler anywhere near its price. Every OC-4 has Oliver's exclusive "Spot-Turn" clutch steering and offers a selection of either "Travel-Reverser" or "Slo-Lo" auxiliary transmissions.

The Oliver OC-46...*faster, better loading due to its factory-built, matched design*

The OC-46 is a full-fledged, heavy-duty ⅝-yd. loader—engineered and factory-built as a compact, highly efficient unit. It's small enough to ride on a 3-ton truck and large enough to do a hard, money-making day's work.

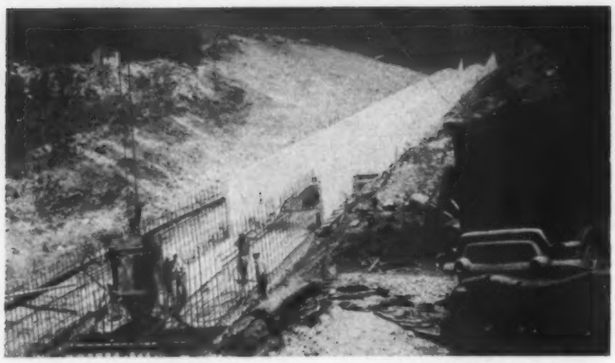
With Oliver's advanced "Spot-Turn" clutch steering, it's tops in value. And you have a choice of proved gasoline or diesel engines, and "Travel-Reverser" or "Slo-Lo" transmissions.

OLIVER **THE OLIVER CORPORATION**

Industrial Division, 19300 Euclid Ave., Cleveland 17, Ohio

a complete line of industrial wheel and crawler tractors and matched allied equipment

For more facts, use Request Card at page 18 and circle No. 329



The Gar-Bro bucket deposits concrete above a slip screed. This screed rides on two pipe screeds that hold it to grade. The slip screed is pulled up the steep grade of the chute by a Jaeger 3,000-pound air tugger that can be seen just inside the completed portion of the chute.

An Allis-Chalmers TractoLoader with 2-yard bucket charges the surge hopper of the Pioneer conveyor leading to the Pioneer 3×10-foot double-deck screen at the Winslow Binanbatch plant. The plant turns out concrete for the emergency ungated ogee overflow spillway.

(*Continued from preceding page*)

Concrete spillway

An emergency ungated ogee overflow spillway on the right abutment will prevent overtopping of the dam in case of severe flood. The overflow spillway and chute leading down to the stream bed are built in natural ground on the north abutment. The steeply inclined chute is 25 feet wide at the top, narrowing to 12.5 feet for most of its length, and widening again to 25 feet at the stilling basin at the bottom.

Lytle's crews formed the walls of the spillway and chute with Economy form panels. Even the rounded walls at the spillway entrance were formed with these panels with very satisfactory results. The floor of the steeply inclined chute was placed with a slip screed riding on 2-inch pipe screeds. The concrete was deposited ahead of the slip screed, and the screed was drawn up the grade by a Jaeger 3,000-pound air tugger to leave the floor smooth and to grade. A minimum of hand finishing was necessary to complete the job.

Although no earthwork could be done during the winter months, the crews continued to work on the concrete structures. An enclosure was built of 2×4 framing covered with 6-mil Visqueen polyethylene film. This enclosure was 12 feet wide and 250 feet long and stood on a 2 to 1 sloping hillside. Inside the enclosure, five Herman Nelson heaters maintained a temperature that was comfortable for the men at work and warm enough to protect the concrete. Under this enclosure, concrete placement continued until January 16, 1958, when the work was shut down until spring because of the deep snow. During the winter, 168 inches of snow fell in this area.

Central concrete plant

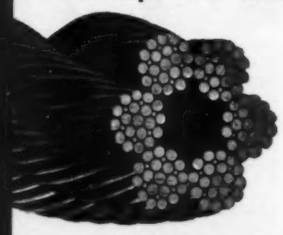
Concrete for the structures was proportioned and mixed in a central plant and delivered to the points of placement in two Maxon 4-yard Dumpcretes mounted on Ford F8 trucks.

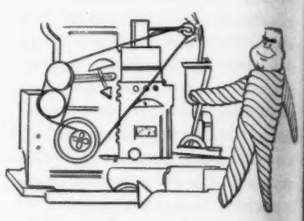
Two sizes of coarse aggregate with maximum sizes of ¾ inch and 1¾ inches were required for the concrete. However, since rescreening at the plant site was also required, Lytle bought the coarse aggregate as a

Tuffy® Wire Rope Tips

To Get The Most for What You Pay Be Sure You Get Correct Rope Lay

Wire Rope is a "Machine" of Moving Parts





...and Every Part Must Fight Destructive Forces

A "look inside" a piece of wire rope reveals a precision-designed assembly of working parts. The parts are core, wire and strand. They are subjected not only to external and internal stresses and strains, but also to heavy surface pressures and abrasions. All these forces may be sustained while the rope is running under very high speeds, and abruptly changing direction of motion. That's why different uses require different constructions of wire rope.

Tuffy Balanced Dragline Rope

Here's highest abrasive resistance with super flexibility. Better spooling. Smoother riding on grooves. And Tuffy Dragline Rope hugs the drum when casting for full load. Gives you longer service life, consistent dependability, in handling any material — wet or dry dirt, sand, gravel, rock, cement or minerals.

Extra Strength Alone is Not Enough... Wire Rope Must Be BALANCED

Sometimes extra strength is heavily stressed in advertising wire rope. While strength is important wherever wire rope is used, it is not the only important property. And there are cases where too much strength is a liability.

For example, manufacturers of scrapers have designed their equipment to take certain loads. These loads are controlled by, or subject to the ultimate strength of the rope. Larger ropes with higher strength do not break, but *the equipment itself begins to break up.*

Depending on your use of wire rope, the "job prescribed" Tuffy Special Purpose Ropes give you the RIGHT BALANCE of strength, toughness, flexibility for greatest efficiency and longest service life.

Tuffy Balanced Slings & Hoist Lines

"Balanced" because they combine strength, flexibility and toughness in the proper relationship to do a better job longer.

Tuffy Slings and Hoist Lines are a top-performing team in every type of materials handling. The slings are made of a patented, machine-braided fabric that's next to impossible to knot or kink. The hoist lines are a special construction in which strength, flexibility and toughness are balanced.

Tuffy Balanced Dozer Rope

Built to give you longer service with less downtime. Mounted on your dozer, a 150' reel of ½" or 9/16" can give you a big bonus of extra service. Here's how: when rope shows drum wear or is crushed on the drum, you feed through just enough to replace the damaged part. You save the 40 to 50 feet ordinarily thrown away. Also available in 300' and 500' reels.

Tuffy Balanced Scraper Rope

"Balanced" construction makes it flexible enough to withstand sharp bends, yet stiff enough to resist looping and kinking when slack gives higher resistance to the shock of impact on slack line. Moves more yardage foot because it's specially built to take beating of drum-crushing abuse.

An early job of stripping topsoil from the borrow pit supplying impervious core material is done by one of the Euclid 6-wheel scrapers push-loaded by a D8. Note the turbocharger equalizer kit on the tractor that compensates for the high altitude.

single size graded from 3/16 inch to 1¾ inches. Since the quantities were relatively small (total concrete yardage being about 3,840 cubic yards) and the haul was in excess of 60 miles, this single aggregate size simplified delivery and stockpiling.

The aggregate was fed from the stockpiles to a conveyor-feeder hopper by an Allis-Chalmers TL-20 TractoLoader with a 2-yard bucket. The 18-inch × 60-foot Pioneer conveyor carried the aggregates to a 3×10-foot double-deck Pioneer vibrating screen at the top of the concrete batching plant. Because the plant was located on the steep side of the canyon, this conveyor was set nearly level.

The Pioneer screen separated the coarse aggregates into the required two sizes and screened out the fines. The screened aggregates fell directly into the hoppers of a Winslow Binanbatch. The TractoLoader fed sand to the same conveyor, which took it directly to the Binanbatch bins.

Bulk cement was received by truck transport from Portland, Colo., and was handled and stored in an Engineered Equipment Co. 320-barrel silo. An Engineered Equipment Co. unloading screw and bucket elevator fed the cement into the silo. It flowed by gravity to the weigh bucket of the Binanbatch.

The rolling weigh bucket of the Binanbatch discharged directly into the skip of a Jaeger 16S mixer, where the measured amount of water was added and the concrete was mixed.

Taking further advantage of the steep hillside, the contractor built a road on the low side of the plant. This road was low enough so that the mixer could discharge directly into the Dumpcrete parked on the road below. When the desired number of batches had been loaded into the Dumpcrete, it proceeded to the point where the concrete was to be placed.

Here the concrete was dumped from the Dumpcrete into a Gar-Bro 1-yard bucket handled by a Koehring 605 crane. The crane swung the bucket to the forms, and Viber air-powered vibrators helped work the mix down around the reinforcing steel. Air for vibrators and other purposes came from two Ingersoll-Rand Gyro-Flo 600-cfm compressors and one 315-cfm compressor located at a central station. The air was piped throughout the job as needed.

During the cold-weather periods when concrete was being produced, the coarse-aggregate stockpile was heated by propane-gas burners in corrugated metal pipes under the stockpiles. Propane burners were also used to heat the water for the mix.

Exposed concrete surfaces were sprayed with Hunt Process white-pigmented curing compound as soon as possible after placement. Formed surfaces were sprayed with the compound as soon as the forms were removed.

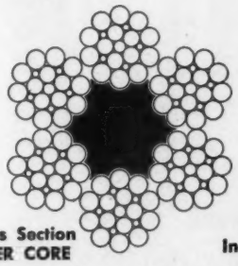
Relocating 4.6 miles of county road around the reservoir was one of the early phases of the work. The Euclid scrapers, D8 dozers, and a Caterpillar No. 12 motor grader handled most of this road work, sandwiching it in between stripping and Zone 2 operations on the dam.

Includes power development

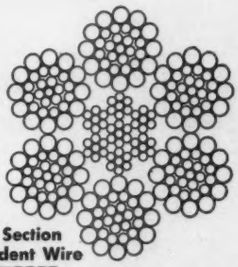
Vega Dam is just the first step in the $14 million Colbran project. A long distribution canal to carry the water the length of Plateau Valley will provide a full irrigation supply for 2,310 acres of new land and a supplemental supply for 18,340 acres of land that now has inadequate irrigation water. The outlet structure and a small section of the canal built under the dam contract will also serve to discharge flows from the reservoir back into the stream bed through a wasteway downstream.

A feeder canal will be constructed to pick up the flows of two Plateau Creek tributaries, which normally

Let's Take A Look at the CORE of Wire Rope



Cross Section FIBER CORE

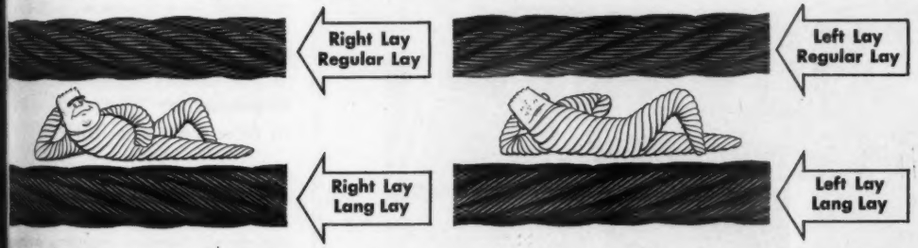


Cross Section Independent Wire ROPE CORE

It's either fiber or steel. Fiber cores are usually made from sisal, java, manila or combination of such hard fibers. Steel cores are either wire strand or an independent wire rope core, which amounts to a separate wire rope. The core serves as a base for the strands, keeping the rope in round shape and providing clearance between the strands for freedom of movement.

It's easy to see why wire rope is a "machine"—deserving the same care in selection and use that is given to any fine machine.

Which Lay of Wire Rope is Right for What Use



The "lay" of a rope is described in directional terms. It's a **right lay** when the strands pass from left to right across the rope. It's **left lay** when they pass from right to left.

Wire rope is also either **regular** or **lang lay**. In the **regular lay** the wires are laid in strands opposite in direction to the lay of the strands. In the **lang lay** rope, the wires are laid in the strands in the same direction as the lay of the strands.

Most wire rope is regular lay. It has the greatest stability under the widest range of uses. On the other hand, lang lay is used in applications where greater flexibility and longer wearing services are needed.

FREE!

Complete Splicing and Socketing manual with engineer's notebook on wire rope constructions and specifications. Write for your copy now. Address Union Wire Rope Corporation, 226 Manchester Ave., Kansas City 26, Missouri.

Specialists in high carbon wire, wire rope, braided wire fabric, stress-relieved wire and strand.

Good Man to Know: Your Nearby Union Wire Rope Distributor

Whether your wire rope need is a scheduled replacement or a red-hot emergency, your Union Wire Rope distributor is ready. He keeps varied stocks of Union standard constructions and the Tuffy Special Purpose Ropes. And he's backed by quick service from his nearby Union Wire Rope depot.

If it isn't rope you need, but advice on a wire rope problem, he's just as ready to help. If you don't know your Union Wire Rope distributor already, look under "Wire Ropes" or "Slings" in your telephone directory yellow pages.

Your Tuffy Distributor Can Help You Get Longest Service Life and Cut Rope Costs

UNION Wire Rope

New steels are born at Armco

Subsidiary of ARMCO STEEL CORPORATION

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4

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(Continued from preceding page)

join the creek below the dam site, and lead them into the reservoir.

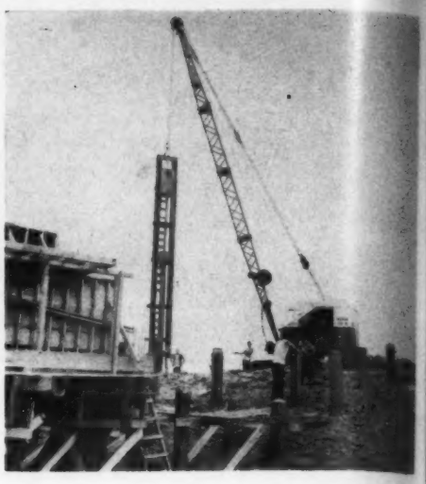
A number of small privately owned reservoirs on Grand Mesa above the valley are to be connected by a system of steel pipelines for delivery to a penstock that leads 2.5 miles downhill to the site of the future Upper Molina power plant. This plant will have a static head of 2,759 feet and a capacity of 8,400 kw. Water discharged from the upper plant will go through the equalizing reservoir into the lower penstock. This penstock will extend 4.7 miles to a power plant that will operate under a static head of 1,572 feet with a capacity of 4,600 kw. Power will be sold to help defray the costs of construction of the project.

Personnel

The crew of about 120 workmen on the C. F. Lytle Construction Co. payroll is supervised by superintendent J. E. "Jim" Dunn. On his staff are project engineer A. D. Gilbertson; office manager H. R. Olson; paymaster George Eels; concrete superintendent E. D. Ledwell; earthwork superintendents J. H. Brown, Clay Tucker, and Paul Foreman; and master mechanic Howard Schoonover.

For the Bureau of Reclamation, the project manager of the Collbran Project is H. F. Bahmeier. The resident engineer is Edward H. Jefferies; chief inspector, Samuel C. Dugan; and field office engineer at Collbran, Jack Gonyer.

THE END



WOOD FALSEWORK PILES are driven with a 3,200-pound drop hammer on a Bucyrus-Erie 15-B for a 240-foot-long 36½-foot-wide overpass bridge near Royalton, Ind. The bridge which will carry Route 334 over the new north-south interstate highway, will be 28 feet high and provide a 14-foot clearance.

Raymond International to build Ecuador port

■ A $16.5 million contract has been awarded to Raymond International Inc., New York City, to build a completely new port at Guayaquil, Ecuador. The new port project consists of three parts: the port itself, a dredged channel in Estero Salado, and a barge canal connecting the new port with the Guayas River. More than 16 million cubic yards of dredging is required.

The port will consist of a 3,000-foot wharf accommodating five berths with four transit sheds, plus a number of warehouses and allied buildings. Below the port, a 400-foot-wide 31-foot-deep channel will be dredged for 11 miles to provide access by ocean-going vessels. The 4-mile barge canal will include a 600-foot-long lock providing a 75-foot clear width and 14-foot depth over the sills at mean low water.

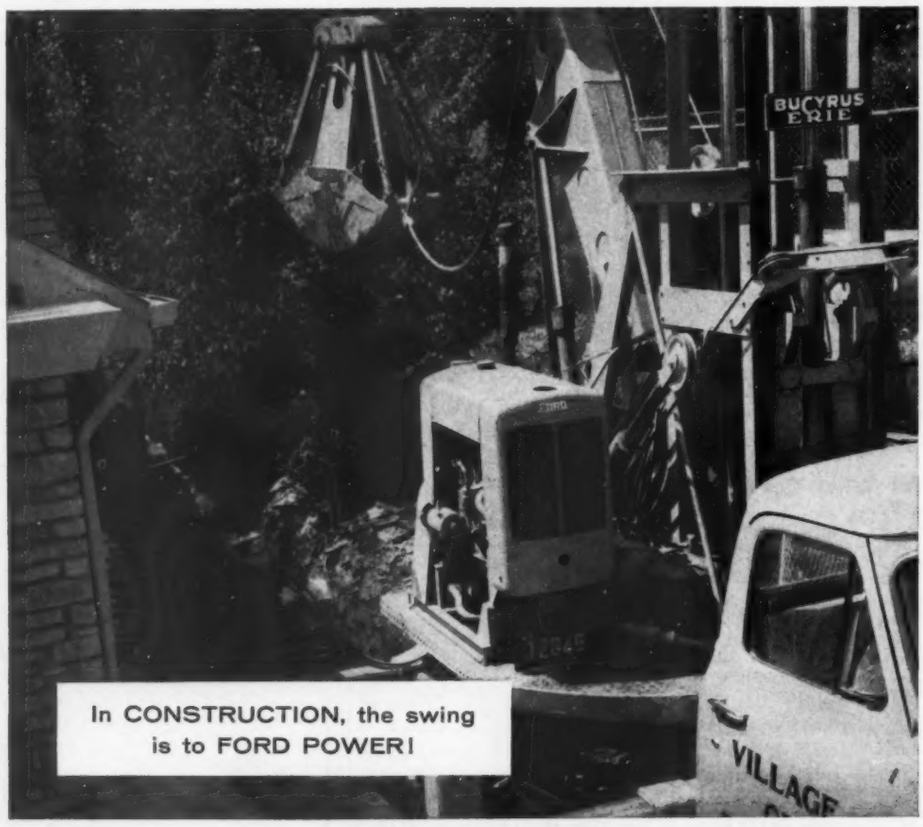
Engineering "firsts" in new CAC brochure

■ "Men, Methods & Machinery," published by Construction Aggregates Corp., describes a number of engineering "firsts," including many pictorial case histories showing methods of operation and equipment used on some of the most unusual projects of their kind ever undertaken. Many unique projects described involve land reclamation and stabilization; hydraulic stripping and dredging; site preparation for industrial plants, highways, and airports; channel and port development; ship salvaging; and sand and gravel production.

Free copies of the English or Spanish edition of the brochure are available from the company, Dept. CI-9, 120 S. LaSalle St., Chicago 3, Ill.

Daniel Construction starts work on plant

■ Daniel Construction Co., Greenville, S. C., has started construction on a new $1½ million Union, S. C. plant for the Conso Fastner division of Consolidated Trimming Corp. The 66,000-square-foot plant will be one story high.



WHY? Ford Engines are tough! Ford Service is everywhere!

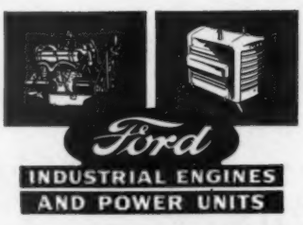
Ford Industrial Engines are becoming the solid favorite on construction jobs everywhere—primarily because of their many durability features.

You'll find, for example, that every Ford Engine has Short Stroke design that cuts engine friction, reduces wear . . . deep-block construction that minimizes vibration, lengthens bearing life . . . and overhead-valve design for greater operating efficiency and economy.

Ford Engines range from 134 to 534 cubic inches . . . including two modern Ford Diesels and three Super Heavy Duty V-8's—*all* available as power units or complete engine assemblies. To meet special fuel needs, gasoline engines can be adapted to LP- or natural gas.

As a Ford power user you need never concern yourself about costly downtime . . . for there's always a Ford Dealer nearby to give you the service you need *when you need it.*

Little wonder more and more profit-minded operators are swinging to Ford every day. For original installation or re-powering, specify Ford Industrial Power.



INDUSTRIAL ENGINE DEPARTMENT • FORD Division of FORD MOTOR COMPANY
P. O. Box 598, Dearborn, Michigan

YOUR JOB IS WELL-POWERED WHEN IT'S FORD-POWERED!

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Theory and design of the diesel engine

A comprehensive treatment of the diesel engine is given in "The Diesel Engine, Its Theory, Basic Design and Economics," by L. V. Armstrong and J. B. Hartman. The book gives a graphic representation of the replacement of two revolutions of 4-stroke cycle by one revolution of 2-stroke cycle. It also contains a mathematical explanation of the workings of a dual-fuel and gas-diesel engine, as well as new and original material on the economics of the diesel engine.

A discussion of petroleum and refining methods is followed by a consideration of diesel fuel combustion, and the effect of the forces released by combustion upon the moving parts of the engine and then on the static or restraining parts of the engines. After a treatment of parasitic engine parts, there is a final section on economics, including power application. The appendix contains problems for each chapter.

Priced at $8.75, the book is available from The Macmillan Co., 60 Fifth Ave., New York 11, N. Y.

L-W withdraws suit against LeTourneau

LeTourneau-Westinghouse Co., Peoria, Ill., has withdrawn a 16-month-old suit in a Texas federal district court against R. G. LeTourneau, Inc., Longview, Texas. The suit was originally filed for clarification purposes; both parties have now reached satisfactory understandings.

At the same time, it was announced that R. G. LeTourneau will introduce two new earthmoving machines within the next few months.

In 1953, the LeTourneau firm sold its earthmoving business, two plants, and certain patents and trademarks for $30 million to Westinghouse Air Brake Co., which established LeTourneau-Westinghouse Co. as a subsidiary. One provision of the sale was that LeTourneau and its president would stay out of the earthmoving equipment business for 5 years, a period which expired in May of last year. The suit was filed in April, 1958.

Greenville Steel drops trade name

Greenville Steel Car Co., Greenville, Pa., has discontinued the Ateco trade name. All rippers, scrapers, loaders, and other related products will be marketed under the trade name of Gremville.

Book on how to invent

"How to Invent," by Forrest E. Gilmore, is a guide to the mental techniques of learning to invent and their application to daily thinking.

Chapters discuss creative thinking, the use of intuition and imagination, preparation for inventing, why one should learn to invent, and patent laws and practices.

Priced at $2.50, the book may be purchased from the Gulf Publishing Co., P. O. Box 2608, Houston 1, Texas.

AT AN INTERSECTION OF TWO TAXIWAYS at Glasgow Air Force Base, Glasgow, Mont., a Cedarapids laydown machine works around a corner. Taxiway paving, foreground, is still curing under burlap. Two and 3-drum tandems and rubber-tire rollers provide compaction. Peter Kiewit Sons' Co., Sheridan, Wyo., holds the $13 million contract for construction of runway, taxiways, aprons, and related facilities.

the right approach to any digging problem

HENDRIX
DRAGLINE BUCKETS

even in wet digging..

Hendrix Dragline Buckets produce MAXIMUM loads for GREATER PROFITS! The scientifically-arranged perforations let water go through . . . leaving more material *inside!*

"A Type for Every Digging Purpose"...
¼ to 40 Cubic Yards-Perforated or Solid

Hendrix Lightweight Dragline Buckets

HENDRIX MANUFACTURING COMPANY, Inc.
MANSFIELD, LOUISIANA
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A dry area 21 feet below sea level is maintained by a Flygt B80L 3-inch pump used by the J. S. Barrett Co., Santa Ana, Calif., on its 5½-mile section of a trunk-sewer line in Orange County, Calif. Flygt pumps were employed for pre-watering and then leapfrogged ahead of the excavation as the ditch was backfilled.

Pre-dewatering halts ground-water intrusion on trunk-sewer project

A successful pre-dewatering of a 19-mile stretch of land along the line of the Miller-Holder trunk sewer in Orange County, Calif., has been accomplished by a fleet of submersible pumps used to battle severe ground-water intrusion. A good part of the sewer line runs through irrigated farm land over low coastal flats. The proximity of the Pacific Ocean and the naturally high ground-water table, along with irrigation water filtering down into the subterranean pool, created a problem for any underground construction. The problem was magnified by the size of the ditch, which was to be 18 to 30 feet deep and from 15 to 40 feet wide.

Taking costs of installation and operation into account, county sanitation district engineers and contractors decided that as much ground water as possible had to be eliminated prior to excavation. Engineers of Gridley Equipment Co., a Los Angeles pump dealer, consulted with contractors during estimation activities and offered a solution developed by Stanco Mfgs. & Sales, Inc., Santa Monica. The plan was to place wells paralleling the line where the trunk sewer would be placed, to tap and remove as much ground water as possible before digging started. Equipped with pumps to draw off ground water, the wells were engineered to dry, and keep dry, exact lengths of the proposed excavation.

Pumps used as "mops"

Weardco Construction, a $90,533 bidder for erection of a pumping station and 2,500 feet of 24-inch sewer pipe, began pre-dewatering with a well system. Using a cesspool auger, crews bored 30-inch holes and then lined them with steel casing to depths of 35 to 50 feet. Inside the 30-inch casings they placed 16-inch perforated steel pipe the depth of the wells. The space between the two pipes was filled with river rock, and the outer casings removed. The contractor then had wells that tapped all levels of ground water, to depths below the bottom of the proposed excavation, so that intrusion was collected continuously.

To remove water flowing into the wells, the contractor placed Flygt 1½-inch B38 or 3-inch B80 pumps in the well bottoms, hooked them to hose running to disposal sites, and turned them on.

For pre-dewatering applications along the sewer line on subsequent contracts, Flygt-powered wells were sunk every 300 feet. Because the rate of flow varied along each job—some stretches were completely dry—wells were placed only where needed. Some areas with 150-foot diameters were dry in two to four weeks. The pumps were powered from existing lines or with portable diesel electric sets.

Underground conditions were good and dry, and what little water remained in trenches was easily handled by Flygt pumps used as "mops."

The most spectacular success of

Morrison-Knudsen Company, Inc., employs M-R-S Model 250 Tractors and Model 250 HW 40 cu. yd., struck—50 yd. heaped—Scrapers on this dam project in Leesburg, Ala. Morrison-Knudsen recently purchased 4 of the R-1550 ROADRANGER-equipped M-R-S Tractor-Scrapers and a 5th Model 250 Tractor used primarily for powering compaction rollers—the company's 3rd purchase of M-R-S 250 combinations in a year. The recent purchase brings the total for the Leesburg job to *eight* M-R-S 250 Scraper combinations and *two* M-R-S 250 Compaction Tractors.

Geared by ***FULLER*** . . .

50 YARDS, heaped, with R-1550 RoadRanger

This M-R-S Model 250 Tractor employs a 600 hp diesel engine and a semi-automatic 9-speed Fuller R-1550 RoadRanger Transmission to pull an M-R-S 250 HW Scraper with a heaped capacity of *50 cubic yards.*

Standard equipment on the huge tractor, the R-1550 RoadRanger features nine forward and two reverse speeds, selected with a single shift lever. With short, even steps—averaging 38%—between forward ratios, the engine can work in the peak hp range at all times, resulting in fast, economical scraper operation.

The Fuller Air-Powered Countershaft Inertia Brake on the R-1550 RoadRanger permits quick, easy up shifts without double clutching, and the Fuller Pressure Filtration and Lubrication System provides positive lubrication, maintains clean gear oil and prolongs gear and bearing life.

For faster work cycles, lower fuel consumption, longer engine life, less operator fatigue, GREATER PROFITS . . . specify Fuller Transmissions.

FULLER TRANSMISSION DIVISION MANUFACTURING COMPANY
KALAMAZOO, MICHIGAN
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Unit Drop Forge Div., Milwaukee 1, Wis. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Sales & Service, All Products, West. Dist. Branch, Oakland 6, Cal. and Southwest Dist. Office, Tulsa 3, Okla. Automotive Products Company, Ltd., Brock House, Langham Street, London W.1, England, European Representative

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◄ A dragline excavates a ditch for placement of 78-inch reinforced-concrete pipe on the Barrett project. Highly abrasive sand and thick adobe clay were removed to carve a 35-foot-deep 40-foot-wide trench.

While the dragline excavates the ditch, a crane handles pipe sections for Barrett's job. Cat diesel electric sets, right, power the dewatering pump. A cased dewatering well is at left foreground. ►

the dewatering method came on the $2,667,727 contract of J. S. Barrett Co., Santa Ana, for installation of 5½ miles of 78-inch reinforced-concrete sewer line and appurtenances. Working just above the treatment plant and across low farm fields within a mile of the beach, Barrett crews carved a ditch 35 feet deep and 40 feet across the top. Pipe laying was carried out 21 feet below sea level at this point. Material ranged from highly abrasive sand to thick adobe clay.

Six Flygt pumps, employed for pre-dewatering, leapfrogged ahead of the excavation. Another six Flygt units were used to keep the ditch dry at points of underground structural work. While the pre-dewatering system made working conditions dry for the Barrett crews, sump pumps were used in the ditch to take care of the little residue or puddles remaining during actual construction.

Other contracts

N. A. Artukovich of Montebello has applied the system on his $1,846,870 contract for the installation of 27,600 feet of 51 to 63-inch reinforced-concrete pipe, using the Flygt B38 to keep the pipe dry behind construction operations and using eight pumps in wells for pre-dewatering.

Monrovia contractor Steve Rados is using three pumps on his $1,547,860 contract to place 20,860 feet of 69-inch reinforced-concrete pipe. He also is using a B38 to keep the pipe dry; Rados is not faced with heavy intrusion like that on the Barrett and Artukovich jobs.

For George Dakovich of Santa Fe Springs, intrusion is a considerable factor along his $1,363,107 job. He is using the pre-dewatering system with a pair of the pumps to help clear the way for 21,000 feet of 45 to 51-inch reinforced-concrete pipe.

The $628,688 contract of Charles Dorfman, Los Angeles, includes installation of 18 to 42-inch line and other facilities. He, too, has adopted the pre-dewatering method of keeping his job dry with a battery of the submersible electric pumps.

THE END

Don't miss the new equipment in Product Parade, page 113.

For more facts, circle No. 334->

CLEVELAND J TRENCHERS

Advantages ACCURACY PRODUCTION ECONOMY

FIT MORE JOBS EVERYWHERE

CLEVELAND J TRENCHERS have exclusive new features and operating advantages which make them the most usable machines ever built for digging trenches. They fit more jobs. They dig economically and profitably under job conditions which heretofore blocked out the practical use of a trenching machine. Everywhere, under *all* job conditions, they dig cleaner more accurate trench — dig it better, faster and cheaper.

These new J trenchers have all the famous features previously pioneered by Cleveland *plus these revolutionary new advantages:*

- *Every* operation is automatic, completely controlled at operator's seat.
- V conveyor — for faster, higher, more efficient spoil discharge.
- Dual, pulley-enclosed, hydraulic conveyor transmissions (no "hung-on" motors, no conveyor chains and sprockets), less belt slippage, fingertip control of belt direction and speeds.
- Automatic conveyor positioning — operator places spoil where needed, digs past poles, trees, etc., without interrupting other operations, without ever leaving his seat.
- World's finest trencher crawler, 1,000-hour-lubricated, big 16" x 3" hydraulic steering brakes, a tremendously long lived, trouble free, easy rolling truck.

Get all the facts now on these new Clevelands from your distributor.

The CLEVELAND TRENCHER Co.

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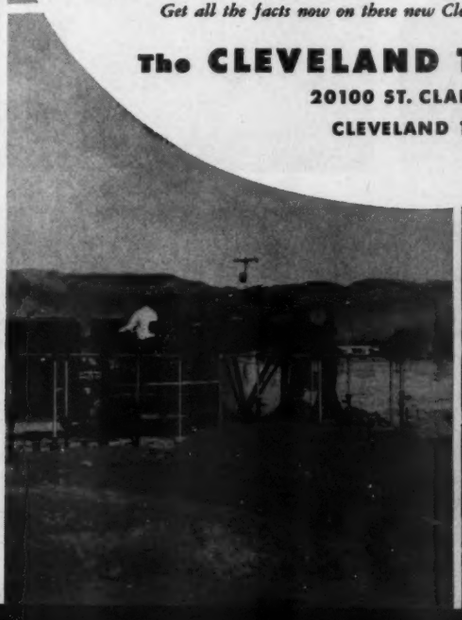


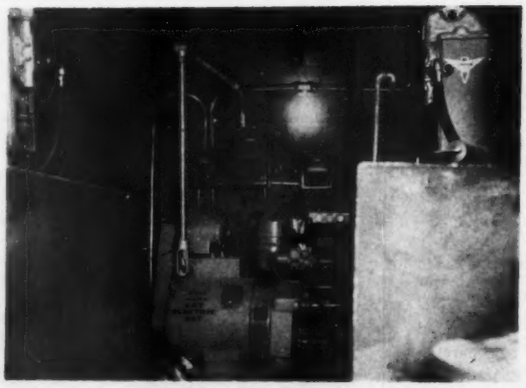
Part of the 18-scraper fleet of Euclids stripping 21 million yards of overburden from a uranium ore body near Jeffrey City, Wyo., work in the pit, which will reach a depth of 300 feet. The TS-24's and TDT's work on two 10-hour shifts in abrasive sand, climb haul roads on 10 to 12 per cent grades out of the pit, and make a haul of almost a mile. Average production is a million yards per month. High production on the isolated job is dependent on the high availability rating of the fleet—92 per cent. Behind this rating stands the contractor's effective maintenance operation.

At the end of the day shift, Euclid scrapers are parked in double rows next to the Butler 50×60-foot shop for daily servicing. A 5-man crew handles the operation with a lube truck designed and outfitted by the contractor's personnel.

Well maintained spread high in availability

by RALPH MONSON, field editor

The lube truck—a Mack Model D20—moves down the line between rows of scrapers. Service reels on both sides supply Texaco differential lube, chassis lube, hydraulic oil, and engine oil. A fifth reel on one side is for air. At this time, air filters are cleaned, and other scheduled servicing is done.



Lincoln Power Master lube pumps dispense lubricants from tanks and barrels inside the lube truck. Electric power for compressor motor, lights, and power tools is supplied by the Cat D311 generator.

Once each shift, when scrapers make a stop to refuel, a man working the lube truck gives the drive lines of the rigs an extra lubrication. Fuel storage tanks, at right, hold more than 25,000 gallons, and the fuel is dispensed by electric pumps.

Crewmen lose no time in jumping aboard the Euclid twin-engine TS-24 with fuel lines. The scrapers use more than 6,000 gallons of fuel daily. While three 8,800-gallon tanks provide an emergency reverse, fuel transport is made daily to the isolated site to make sure no shortage develops.

(Additional photo on front cover)

Between regular duties, the lube truck services the International station wagon used to transport workmen to and from the pit. The Euclid TS-24, background, is unloading on the waste pile. Rigs had to climb as much as 200 feet to the tops of spoil banks.

Moving more than a million cubic yards of dirt per month calls for keeping a big scraper spread in full operation with a minimum of downtime. This is exactly what Maco Construction Co., Rawlins, Wyo., is doing on the stripping of 21 million yards of overburden from a uranium ore body near Jeffrey City, Wyo., for Western Nuclear Corp.

The spread of 18 Euclid scrapers includes twelve TS-24 twin-engine machines and six older 6-wheelers. Ripping, push-loading, and dozing are handled by five "Euc" TC-12 twin-engine tractors and two Cat D8's. Four TC-12's and ten of the TS-24's were new at the start of the job last March. At that time these were the only TC-12's at work in Wyoming. A pair of Cat 12 motor graders maintains the haul roads.

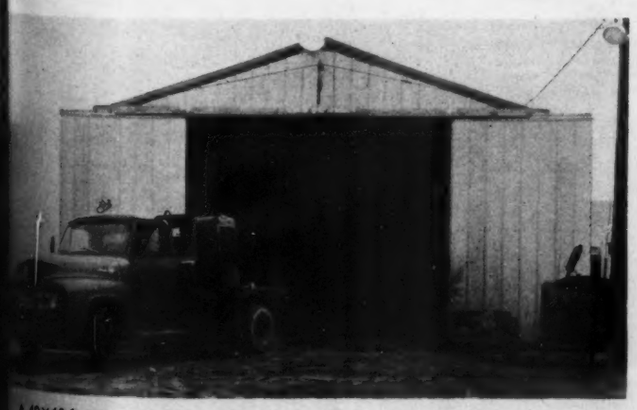
Working two 10-hour shifts five or six days a week, this spread has averaged more than a million cubic yards a month on a haul averaging nearly a mile long. The pit being excavated reaches a depth of approximately 300 feet, and the big scrapers climb as much as another 200 feet to the top of the spoil banks. Haul roads coming out of the pit have grades of 10 to 12 per cent.

This high production was accomplished by keeping the rigs operating most of the time and holding downtime to a minimum. The entire spread has had an availability rating of over 92 per cent, and many of the machines have been working more than 95 per cent of the time. This is not easy to attain; the equipment is working in an abrasive sand in an area noted for sand storms, and the job is some 50 miles over gravel roads from the nearest parts source.

Maco's president, Malcolm R. Smith, credits several factors with contributing to the good operating record and minimum downtime. Among these are careful and regular servicing by trained workmen using an excellent lube rig, an "exchange

(Continued on next page)

This field repair shop, a Butler 50×60-foot metal building, is equipped for emergency repairs, but major components are usually taken to the central shops in Rawlins for overhaul. Engines, transmissions, and torque converters are replaced with a spare immediately so that no time is lost.



A 40×60-foot Butler building is used primarily by the two welders; the rear area serves for tire storage. The Hobart 400-amp welder on the Ford truck is used for emergency work anywhere on the project, as well as in the shop.

On the landing strip that is actually the top of a spoil bank, equipment supervisor Ed Steinfeld unloads emergency repair parts from the company's Cessna Skylane. A GMC pickup stands by. Plenty of downtime is averted by using the plane to pick up spare parts. The trip to Casper and back may take less than an hour and save a full day for a rig.

A welder makes a repair on one of the older Euclid 23-TDT scrapers, using the Hobart welding generator on the Ford truck. At least six of these TDT's were kept on the job; others were turned in on a new spread of TS-24's and TC-12 tractors that are well adapted to the work.

A welder applies Amsco super 20 hardfacing to the face of the teeth used by the Koehring backhoe in trenching for drainage in the pit. Stoody 1027 is used for hardfacing teeth used on some of the scraper bits. Welding is done in stalls in the Butler 40×60-foot shop.

(Continued from preceding page)

rather than repair" policy on engines, transmissions, etc., and liberal use of the firm's Cessna Skylane airplane to rush parts to the job.

An equally important factor, especially during the warranty period on the new machines, was the cooperation of Colorado Builders Supply Co., of Denver and Casper, Wyo., the local Euclid distributors. Colorado Builders Supply kept a skilled serviceman and a supply of parts on hand.

Buys new machines

With a job set up to move more than 21 million cubic yards of material in a period of 30 months, Maco decided to invest in the spread of TS-24 scrapers and TC-12 tractors. Some of the firm's older rigs were turned in on the deal, but at least six of the TDT scrapers were kept on the job. The powerful TS-24's are especially well adapted to the operation because of their ability to maintain a relatively high speed up the steep haul roads with full (sideboarded) loads. They dump without any assistance and maintain the top of the spoil bank in a smooth and uniform condition without even the assistance of a motor grader. In fact, the top of one large spoil bank has become the 2,000-foot landing strip for the company's airplane.

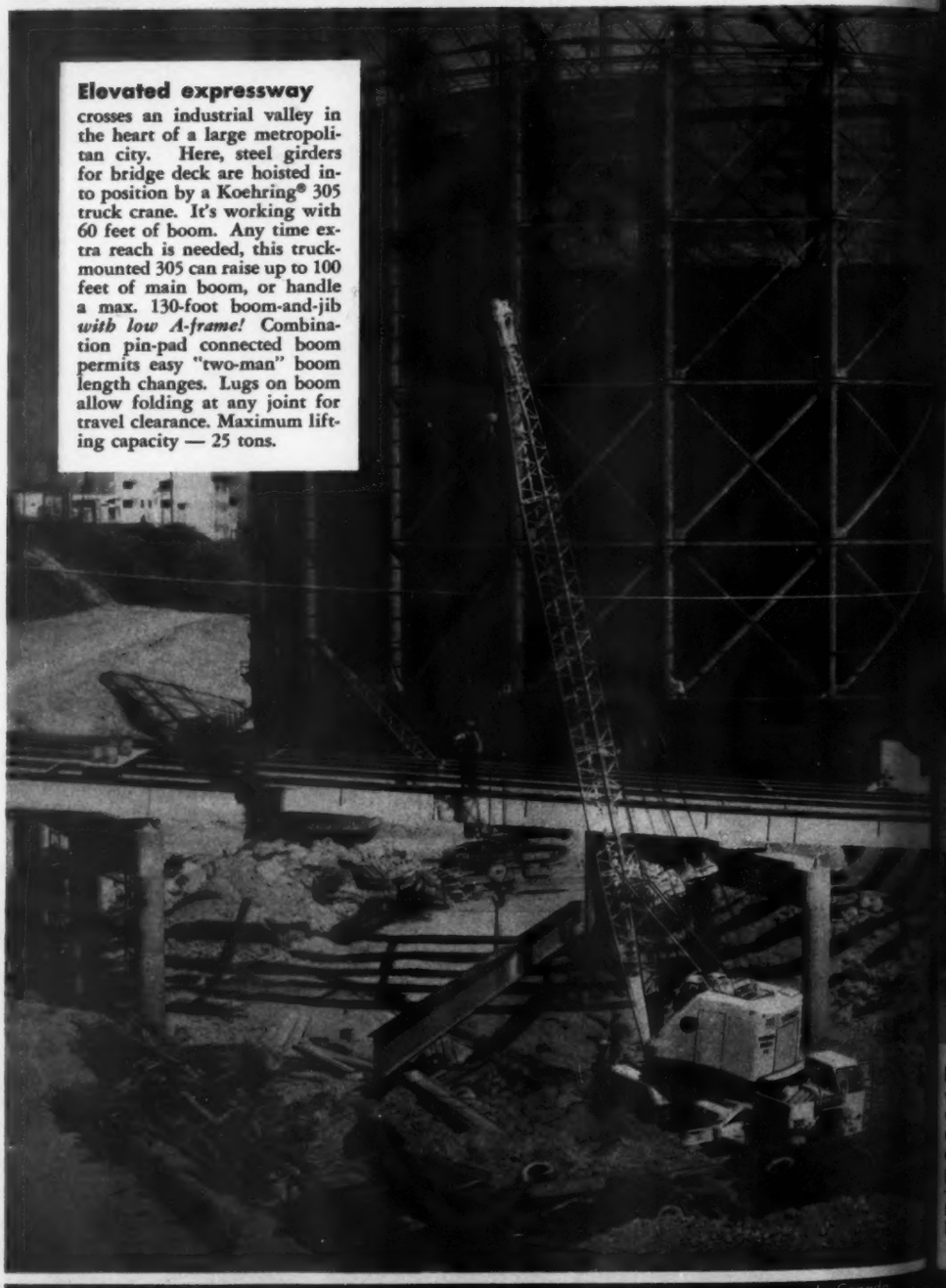
In the pit, two of the TC-12 tractors are fitted with Ateco rippers that are used extensively in penetrating tough layers of clay and cemented sands. The other tractors push-load the scrapers. Some of the push-tractors are equipped with rear push-blocks to permit double push-loading whenever two tractors are available at the same time.

Daily servicing

All of the machines are serviced daily during the afternoon break between shifts. At the close of the day shift at 4:30 p.m., all of the scrapers are lined up in double rows in the yard adjacent to the repair shops. The tractors remain in the pit. The five men of the service crew give each machine a thorough lubrication, clean air filters, change oil, and perform other scheduled service operations.

To facilitate this work, Maco per-

KOEHRING WORK CAPACITY *on rubber...*



Elevated expressway crosses an industrial valley in the heart of a large metropolitan city. Here, steel girders for bridge deck are hoisted into position by a Koehring® 305 truck crane. It's working with 60 feet of boom. Any time extra reach is needed, this truck-mounted 305 can raise up to 100 feet of main boom, or handle a max. 130-foot boom-and-jib *with low A-frame!* Combination pin-pad connected boom permits easy "two-man" boom length changes. Lugs on boom allow folding at any joint for travel clearance. Maximum lifting capacity — 25 tons.

KOEHRING DIVISION OF KOEHRING CO., Milwaukee 16, Wis. In Canada: KOEHRING-WATEROUS Brantford, Ont.
ENGLAND • SPAIN • JAPAN

One of the Cat D8 tractors on the job is overhauled in the Butler warehouse, which is fitted with aluminum insulation.

sonnel designed and outfitted a lube truck with some unusual features. The Mack Model D20 cab-over-engine truck is fitted with a completely enclosed van, designed to utilize the waste heat of its compressor and generator engine to keep the rig warm during the winter.

Two sets of Lincoln hose reels, five on one side and four on the other, make it convenient for two lube men to work from opposite sides as the rig moves along between the rows of parked scrapers. The five reels carry Texaco differential lube, chassis lube, hydraulic oil, engine oil, and air. The four reels on the other side carry the same lubricants but no air. Lincoln Power Master lube pumps supply the lubricants from barrels and tanks inside the van. Each of these big pumps, with 4½-inch air motors, can supply two of the service reels. An Ingersoll-Rand electrically driven compressor furnishes the air.

Another feature of the rig is the relatively large Caterpillar D311 electrical generating set that provides power for the compressor, floodlights, and power tools.

In addition to being serviced daily between shifts, the drive lines of the TS-24's are lubricated once each shift while the rigs are refueling. One lube man performs this operation while the rigs are at the fuel pumps.

Maintenance on this job virtually had to be self-sufficient, for Riverton is some 50 miles to the west, Casper is even farther to the east, and Jeffrey City, a new town being built by Western Nuclear Corp., is 25 miles to the south. And distance isn't the only thing that makes the job isolated. The contractor is working in a semimountainous, almost roadless part of Wyoming that until recently was inhabited primarily by antelope. Recent developments of uranium mines and processing plants have made population boom in this section of the state, but the roads still belong to a past era.

Need daily transport of fuel

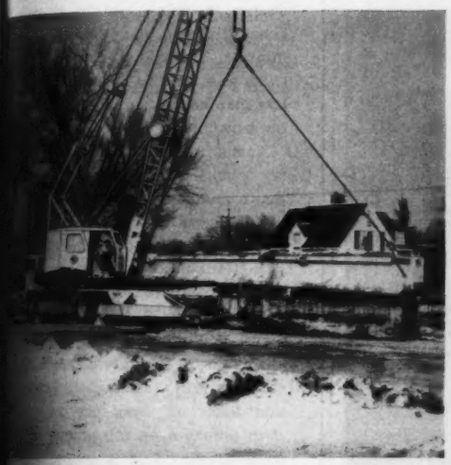
Since the rigs burn from 6,000 to 6,500 gallons of fuel per day, it is necessary to have a transport making delivery practically every day. An emergency reserve is carried in the three 8,800-gallon tanks on the site, but there is genuine concern on the job any day that the daily fuel transport fails to show up. Fuel and lubricants are supplied exclusively by Texaco, Inc., with delivery being made by truck from Casper.

Electrically powered dispensing pumps transfer the fuel from the storage tanks to the scrapers at a high rate of flow. The tractors and other equipment working away from the shop area are fueled by a truck that carries a 2,000-gallon tank.

Components are exchanged

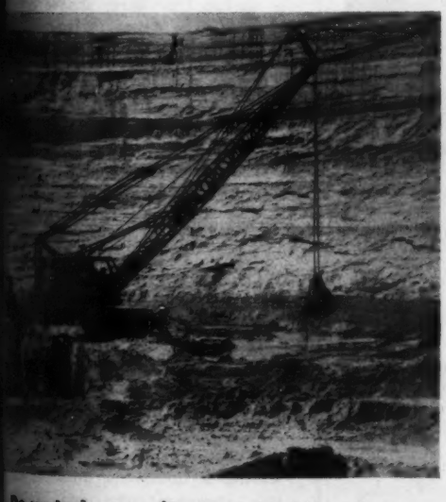
Using the weekends and the long afternoon break between shifts, the seven mechanics on the project make most of the repairs without causing actual downtime for the machines. Minor repairs and adjustments are made as the need arises, but major work on engines, transmissions, torque convertors, and other components is done in the Rawlins shops. These components are removed from the machine and replaced with spare components that are kept on hand. The time for replacement of the component is usually much less than the time required for the overhaul or repair. In many cases, the exchange is made without lost time for the machine.

Engines and other major components are usually taken by truck to the central shops in Rawlins for



Handle with care! Here's a delicate operation — lifting newly-cast, pre-stressed concrete beams out of forms, and stacking them for use on bridge construction. Each beam weighs 22 tons — an easy lift for the Koehring 435 truck crane. Based on conservative 85% rating it can safely lift up to 35 tons with 40-foot boom — *at 15-foot radius.*

New sewer line going in — and 16,378 lineal feet of concrete pipe are being placed along the right-of-way by a 15-ton, self-propelled 205 Cruiser® crane. It's 1-man operated, travels at speeds up to 21.5 mph. Axle-load distribution meets highway regulations in most areas — even when carrying 25-foot folded boom. Overall width is only 8 feet.



De-watering a pit — Koehring 545 truck crane with clamshell digs a central drainage sump from which water is pumped out of deep, open-pit uranium mine. This big, truck-mounted 545 is a heavy-duty work-horse on wheels! Has a top lifting capacity of 45 tons (40-ft. boom at 15-ft. radius) — handles up to 120 feet of main boom, or 150-foot boom-and-jib. Quickly strips for roading. Power-lowered A-frame removes the counterweight.

Quick facts on KOEHRING WORK CAPACITY:

MODEL	TYPE OF MOUNTING	CRANE LIFT CAPACITIES (Rubber-tired machines rated at 85% of tipping load.)	
ON RUBBER			
205	3-axle truck, or 21.5 mph Cruiser	30,000 lbs.	at 12-ft. radius
305	3-axle truck, or 18 mph Cruiser	30,000 lbs.	at 12-ft. radius
300	3-axle truck	40,000 lbs.	at 15-ft. radius
455	4-axle truck	70,000 lbs.	at 15-ft. radius
545	4-axle truck	90,000 lbs.	at 15-ft. radius
ON CRAWLERS	Size shovel	CRANE LIFT CAPACITIES (Crawler ratings based on 75% of tipping load.)	
305	½ Cu. Yd.	20,000 lbs.	at 10-ft. radius
205	¾ Cu. Yd.	30,000 lbs.	at 12-ft. radius
300	1 Cu. Yd.	40,000 lbs.	at 15-ft. radius
545	(Crane only — 85% rating)	90,000 lbs.	at 12-ft. radius
665	1½ Cu. Yds.	72,300 lbs.	at 12-ft. radius
685	2 Cu. Yds.	104,200 lbs.	at 12-ft. radius
1200	3 Cu. Yds.	190,000 lbs.	at 12-ft. radius

K929

Extra lift capacity means MORE WORK CAPACITY with all attachments

For more facts, use Request Card at page 18 and circle No. 335

(Continued from preceding page)

The men who run the job, left to right, are utility foreman Carl Johnson, shift foreman Merle Narramore, job super Arthur Steinfeld, master mechanic E. D. Perry, maintenance foreman Ed Steinfeld, and Maco president Malcolm R. Smith.

overhaul, although the field shops are well equipped and stocked to handle repairs in emergencies.

One of the field shops is a Butler 50×60-foot metal building with three stalls to accommodate equipment when work is done in cold or inclement weather. The other shop is a Butler 40×60-foot building, and its two stalls are generally used by the project's two welders and for the storage of spare tires. Between the two shop buildings are well stocked parts trailers.

Tire service is supplied by Chief Tire Recapping Service of Rock Springs and Cheyenne, which keeps a service man and a rig for handling the big tires on the job daily. This man checks all of the tires during the shift break every day and provides such additional service as is required. He also checks and services the batteries for the entire spread.

Plane speeds parts delivery

In this remote location, the emergency delivery of parts could be a major cause of downtime. Though the contractor's truck makes almost daily trips to Rawlins or Casper from the job, the great distance and poor roads could still result in long delays.

The contractor's Cessna Skylane airplane has been the solution to this troublesome problem. A mobile radio-telephone (until lines are available) provides communication from the job office to the home office in Rawlins and to the distributor's warehouse in Casper. A phone call in an emergency gets the plane on its way in minutes. The trip to Casper for the parts and back to the job may take less than an hour and save a full day for a machine.

The airplane also provides transportation for president Malcolm Smith and others who must travel to and from the site. In the first six months of the job's operation, Smith visited the job an average of three times a week, always by the airplane.

The Cessna Skylane, a de luxe model of the Cessna 182 4-place craft has a 230-hp Continental engine and cruises at 170 mph. It easily lands on and takes off from the 2,000-foot strip prepared on top of one of the waste areas.

Under the watchful eye of superintendent Arthur Steinfeld, the job appears to run very smoothly. An experienced observer commented that there seemed to be no pushing as the big scrapers swung steadily through their loading and dumping cycles. Yet a random time study showed times ranging from 8.5 to 13 minutes for the complete cycle—loading, dumping, and approximately 5,000 feet (one way) of haul. The constant and uniform roar of engines told the story.

Assisting Steinfeld with the supervision are shift foremen Merle Narramore and Hugh Tripp, maintenance foreman Ed Steinfeld, master mechanic E. D. Perry, and utility foreman Carl Johnson.

The unusual shift hours were arranged at the request of the workmen, who appear well satisfied with the arrangement. The night shift starts at 7:30 p.m. and works until 6:00 a.m. when the day shift takes over. The day shift is through at 4:30, leaving a three-hour break in the late afternoon. The men change shifts every two weeks.

The operations of this spread were of sufficient interest to rate a visit to the project in July by Euclid's vice president and manager Ray Armington, chief engineer John Carrol, and sales manager Virgil Snow. The men flew out to Casper by commercial air line and were taxied to the job site by Colorado Builders Supply for a firsthand look at the work.

Reduce your ACTUAL OIL costs!
60¢ per gal. with 60 hour drain period = 60¢ actual cost.
90¢ per gal. with 180 hour drain period = 30¢ actual cost.
$1.00 per gal. with 240 hour drain period = 25¢ actual cost.
You can save 25% to 50% on engine oil with D-A controlled lubrication by using D-A's accurate laboratory service to determine maximum safe drain periods.

Controlled lubrication means more hours of safe operation for each lubrication dollar. With D-A "Extra-Treated" Diesel Oil you can greatly extend your drain periods . . . up to 400% . . . and save on both oil costs and equipment maintenance. D-A "Extra-Treated" Diesel Oil offers these advantages: high, natural viscosity index for added protection against wear; more and better additives to prevent additive starvation and to hold harmful wastes in suspension; neutralization of acid corrosion even under abnormally severe conditions.

To take advantage of the superiority of D-A "Extra Treated" Diesel Oil, you must *know* how far you may safely lengthen your drain intervals. To do this, D-A's free laboratory analysis is at your service. Ask your local D-A representative for details; he will be glad to show you how you can get the best lubrication for the least cost.

Lubricating heavy-duty equipment across the nation since 1919.

D-A LUBRICANT COMPANY, INC. • INDIANAPOLIS 23, IND.

For more facts, use Request Card at page 18 and circle No. 336

Names in the News

Col. Howard S. Ives, commissioner of the Connecticut State Highway Department.

Connecticut names highway commissioner

Col. Howard S. Ives (U.S.A., ret.) has assumed the duties of commissioner of the Connecticut State Highway Department, succeeding Newman E. Argraves. Col. Ives has had a great deal of experience on the construction of some of the state's larger bridges, including the Middletown-Portland Bridge, the Housatonic River Bridge between Stratford and Milford, and the Charter Oak Bridge at Hartford.

Charles J. Patterson, vice president for public relations and special assistant to the president of the Perini Corp.

Perini elects executive

Charles J. Patterson has been elected a vice president of Perini Corp., Framingham, Mass. He will handle public relations and be a special assistant to the president.

George S. LaPorte, Jr., has joined the organization as manager of the Industrial and Commercial Development Division.

Corps assigns engineer for military, civil works

Col. Edwin J. Withers has been assigned to the U. S. Army Engineer Division, South Pacific, as an assistant division engineer. He will aid in the programing, budgeting, and general management of an annual $200 million military and civil-works construction program throughout California, Utah, Nevada, Arizona, and parts of New Mexico, Colorado, Wyoming, Idaho, and Oregon.

Col. Withers will supervise such civil-works programs as navigation, harbor development, etc.

Stone & Webster names

P. Lawrence Doherty has been promoted to personnel manager of Stone & Webster Engineering Corp., Boston and New York City. He was previously assistant personnel manager.

Three assistant vice presidents have been appointed: Robert S. Boyd, appraisal manager; J. Marshall Hamill, administrative assistant in Boston; and Wilbur S. Roberts, Jr., manager of new business activities of New York.

McGraw subsidiary elects officers and directors

Engineering Supervision Co., a subsidiary of F. H. McGraw & Co., New York City, has elected six new directors and officers. Robert Burroughs, an executive of the parent firm, will serve as vice president; Paul G. Gubbins and David Whittlesey, both of McGraw, will be secretary and treasurer, respectively. Dr. George Gerard continues as vice president, and Alexander Zeitlin as president.

Clifford S. Strike, president of McGraw, has been elected chairman of the board, and Milton Meissner and Joel Morris are new directors. Morris will also serve as a vice president of the research and development firm.

Highway commission elects vice chairman

The Wisconsin State Highway Commission elected Harvey Grasse vice chairman at its first organizational meeting following Grasse's appointment to the commission.

Construction firm elects

The Los Angeles engineering and construction firm, The Ralph M. Parsons Co., has elected Robert V. Peaslee a vice president. He will be located in the company's New York City office.

A. Harris Barber, Jr., business-development manager for the central district of Western-Knapp.

WKE names manager

A. Harris Barber, Jr., has been named business-development manager of the central district by Western-Knapp Engineering Co., San Francisco. From Chicago headquarters, he will represent the engineering and construction firm throughout most of the Midwest.

Beth-Cu-Loy culvert under 43 ft of fill

Poking its nose out from under a 43-ft fill of earth and rock is a 292-ft-long culvert of 8-gage Beth-Cu-Loy corrugated galvanized steel. This 42-in.-diameter culvert rests easy beneath its tremendous burden because Beth-Cu-Loy pipe is flexible, thus tends to distribute the stresses peripherally.

Flexibility also permits corrugated galvanized steel pipe to take the impact and vibration of heavy vehicular traffic. It takes care of changes caused by freezing and shifting soil, and makes grading and alignment easy. Installation is simple and speedy, without need for heavy special equipment.

Beth-Cu-Loy culvert sheets conform to the rigid specs of the AASHO. Rolled from open-hearth steel, these sheets contain copper for added corrosion-resistance. Additional protection comes from a tight, 2-oz coating of Prime Western zinc.

We'll be glad to send you full details about Beth-Cu-Loy culvert sheets, as well as the names of fabricators who form them into pipe. Just call or drop a line to the nearest Bethlehem district office.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

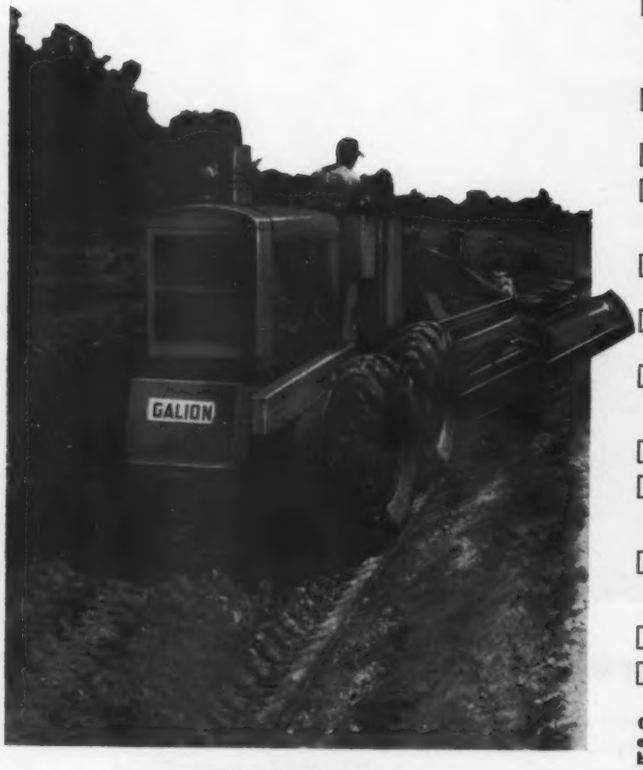
For more facts, use Request Card at page 18 and circle No. 337

ON THE NORTH-SOUTH FREEWAY—N. J. 42—a Blaw-Knox spreader makes a second pass to bring the 9-inch reinforced slab to its full depth. A Flex-Plane finishing-floating machine closely follows. Franklin Contracting Co., Little Falls, N. J., mechanized its paving spread whenever possible, and was able to place an average of 2,200 to 2,500 square yards of concrete during an 8-hour day.

Buy on FACTS that benefit YOU

...and you'll buy the

GALION 160 Grader !



STANDARD EQUIPMENT INCLUDES . . .

- ☐ 160 hp direct-starting diesel engine.
- ☐ Power balanced to weight—rear end 20,200 lbs., front end 8,320 lbs., provides the utmost in tractive effort and front end stability.
- ☐ Combination manual with hydraulic power steering.
- ☐ Four-wheel hydraulic brakes.
- ☐ Tires 14.00 x 24, 10 ply, same size front and rear—interchangeable.
- ☐ Hydraulic power shift moldboard (13' x 29" x ¾").
- ☐ Front wheel spindles (3⅜" x 2") designed for large tires.
- ☐ Positive-acting leaning front wheels. Simple maintenance—only two grease fittings to service.
- ☐ Full hydraulic control.
- ☐ Eight-unit control manifold for convenient installation of extra attachments.
- ☐ Two-stick shift mechanism for the 6-speed constant-mesh transmission.
- ☐ Full-floating rear axles.
- ☐ Extra-heavy frame, weight per ft. 134 lbs.

Check the features included as STANDARD equipment on the grader you may have been thinking of buying. Then ask yourself—"Which offers me the MOST for my money?—GALION Model 160."

Write for literature.

THE GALION IRON WORKS & MFG. CO.

General and Export Offices Galion, Ohio, U.S.A.

Cable Address—GALIONIRON, Galion, Ohio

GALION ESTABLISHED 1907

MOTOR GRADERS & ROLLERS

For more facts, use Request Card at page 18 and circle No. 338

Placing reinforcing bars discussed in CRSI manual

■ A pocket-size 1959 edition of "CRSI Recommended Practice for Placing Reinforcing Bars" is available for $3 from the Concrete Reinforcing Steel Institute, 38 S. Dearborn St., Chicago, Ill.

The main section includes hints on unloading and storing reinforcing bars, preassembly, handling of bars, and placing plans and specifications. Bar supports and spacers and the placing of bar supports in various types of construction are covered thoroughly. Specifications and detailed instructions are given for placing bars in footings, columns, foundations, walls, floors, columns, and beams.

Also described are various types of reinforced-concrete construction including buildings, shells, domes, bridges, bins, and tanks. A general section describes individual structural members.

The manual is profusely illustrated with photographs and detailed drawings.

AISC issues bulletin on fireproof materials

■ "Fire-Resistant Construction in Modern Steel-Framed Buildings" is a new booklet from the American Institute of Steel Construction, Inc. It presents the significant features of the fire-protective materials and fire-resistant systems that make steel-framed buildings structurally safe from fire.

Included in the booklet are sections on modern building codes, with reference to general acceptance of performance tests; the characteristics of safe, dependable fireproofing materials; the concept of light-frame fire-resistant steel construction; and a reference table showing more than 150 fire-resistant constructions and their ratings.

Copies of the booklet are available free of charge from the AISC, 101 Park Ave., New York 17, N. Y.

County engineers elect

Robert F. Stewart has been elected a director of the executive board of the Nassau County Chapter of the New York State Society of Professional Engineers. He will serve out the unexpired term of Walter J. Pope. Stewart is a member of the engineering firm of Lockwood, Kessler & Bartlett, Inc., Syosset, N. Y.

PRODUCT PARADE

For further information on any of the products described in the following section, circle the designated number on the Request Card at page 18.

Add 1½-cubic-yard-capacity unit to tractor-shovel line

A new 1½-cubic-yard tractor shovel is announced by the Allis-Chalmers Mfg. Co.

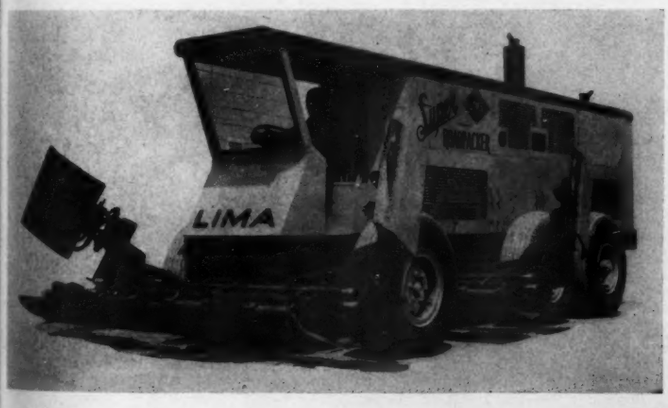
A 4-cycle diesel engine rated at 72 net horsepower powers the machine. Four forward speeds from 1.5 to 5.5 mph and two reverse speeds of 2.0 and 4.1 mph may be selected with the single lever shift located within easy reach of the operator.

The dumping height is over 9 feet. The new curved-bottom bucket tips back 40 degrees at ground level, with 21,500 pounds of pry-out force at the cutting edge.

Solid steel booms and linkage are fully in line with the lift and dump cylinders. Wide-spaced boom pivots are straddle-mounted on the double-walled shovel side frames for maximum stability and strength.

A wide variety of versatile attachments is available.

For further information write to the Allis-Chalmers Mfg. Co., Dept. C&E, P. O. Box 512, Milwaukee, Wis., or use the Request Card that is bound in at page 18. Circle No. 53.



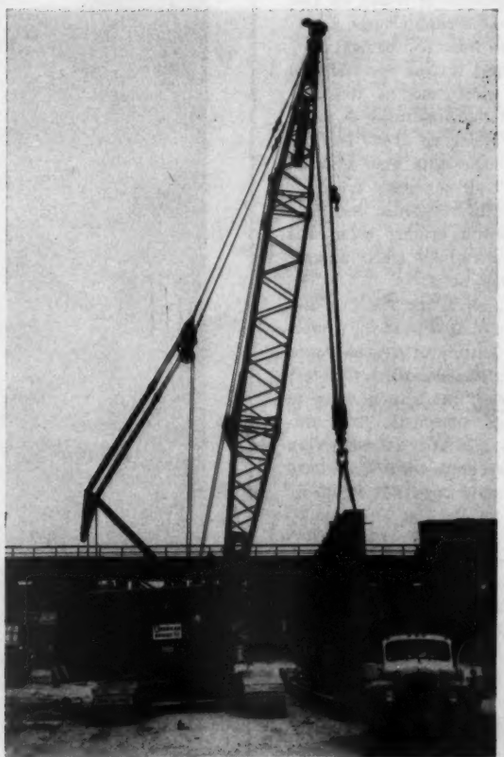
Vibratory compactor can compact at speeds from 26 to 268 fpm

An exceptionally high-capacity vibratory compactor named the Super-Roadpacker is available from the Baldwin-Lima-Hamilton Corp.

Compaction is accomplished by two 15-foot rows of vibrating shoes, arranged in tandem. One row of six shoes is mounted ahead of the vehicle's front axle; the other, also with six shoes, is mounted behind the front axle. The shoes can compact at varying widths and at speeds up to 2,200 oscillations per minute.

The machine has a maximum gross weight of 26,900 pounds. It can travel at speeds up to 24 mph and can compact at any speed between 26 and 268 fpm.

For further information write to the Construction Equipment Division, Baldwin-Lima-Hamilton Corp., Dept. C&E, Box 431, Lima, Ohio, or use the Request Card at page 18. Circle No. 142.

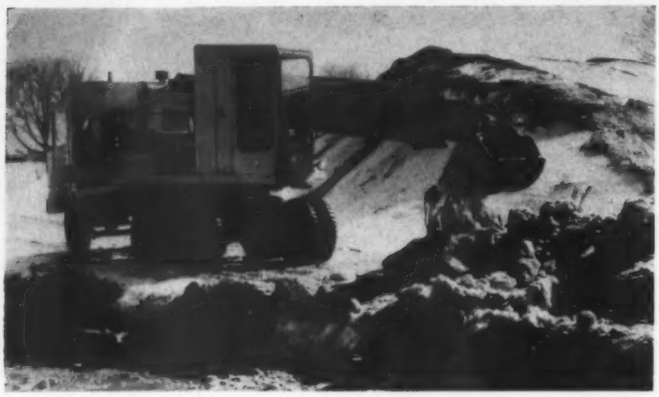


Manitowoc crane lifts 125 tons at a 17-foot radius

The Model 4000 lift crane, featuring 125-ton lifting capacity at a 17-foot radius, is offered by the Manitowoc Engineering Corp.

In the unit's upper works is a big double-drum boom hoist of the self-locking worm-gear type that cannot free-wheel. Optional features include independent boom hoist, independent swing, high-capacity gantry, automatic and pantograph boom stops, equalizer and pendant-type rigging, and manual or air controls.

For further information write to the Manitowoc Engineering Corp., Dept. C&E, 16th and River Sts., Manitowoc, Wis., or use the Request Card at page 18. Circle No. 143.



As part of a flood-control program in Scarborough Township, Ont., Canada, this Gradall digs chunks of ice up to 3 feet thick from a slew into which community drainage flows. This excavator is owned by the Canadian firm of L. G. Rawding Co. For further information on Gradalls, write to the **Warner & Swasey Co.**, Gradall Division, Dept. C&E, 5701 Carnegie Ave., Cleveland, Ohio, or use the Request Card at page 18. Circle No. 31.

Drills get high footage in tough winter project

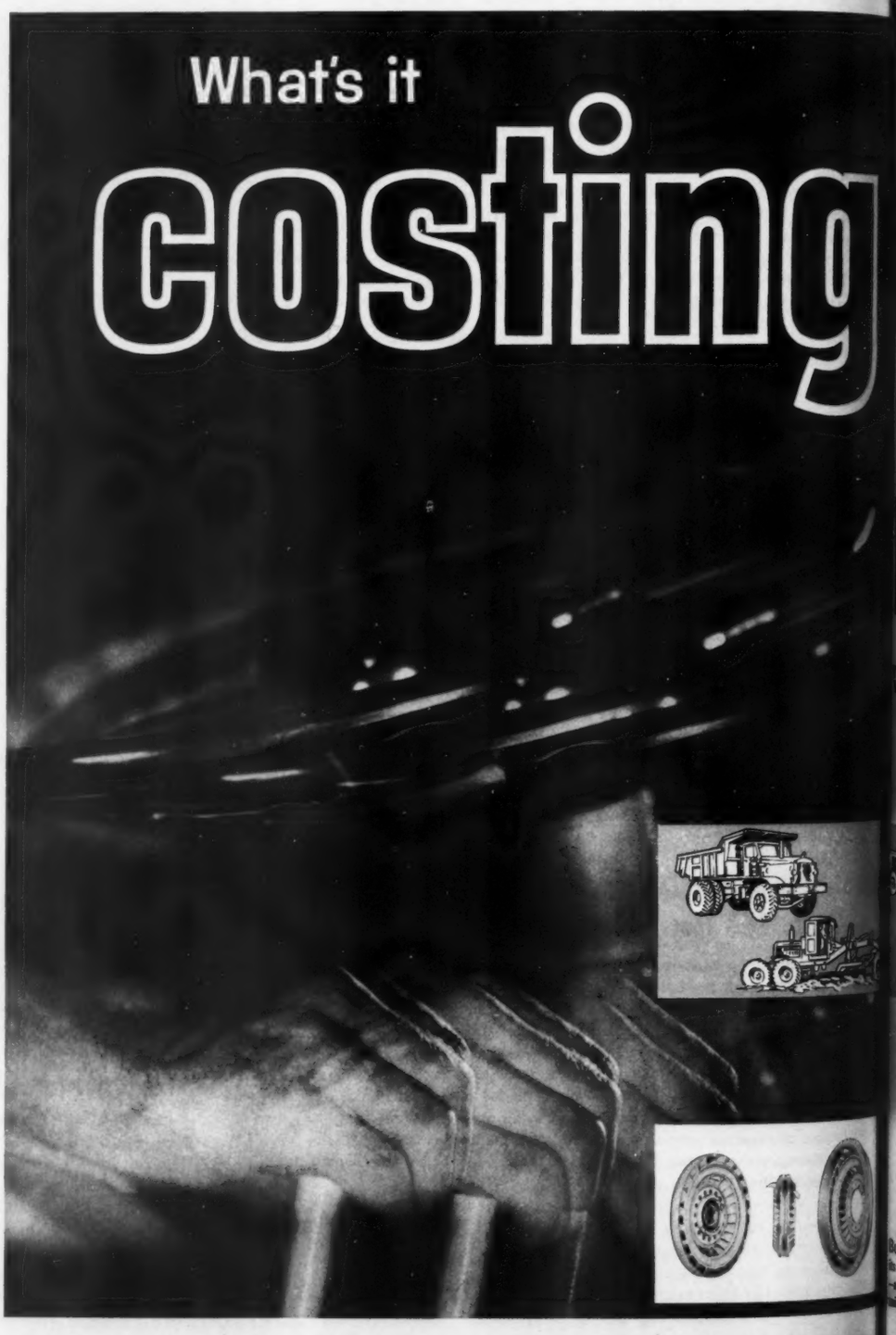
To find drilling equipment that could work a 20-hour-day, 7-day-a-week schedule excavating in permafrost at temperatures of 50 degrees below zero was the problem faced by a Canadian company recently, when it was awarded the $15.5 million Kelsey Generating Station project at northern Manitoba's Nelson River. Initial drilling plans and equipment proved wholly inadequate. The surface under the drilling rigs, which was a composition of frozen ice and silt, had melted continuously, enveloping rigs in three feet of mud.

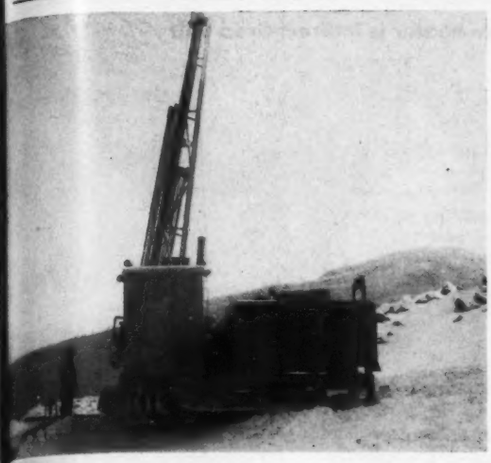
By confining drilling operations to the frigid winter months, the contractors, McNamara-Brown & Root, were able to sink up to 375 feet per rig per 10-hour shift. Four Chicago Pneumatic air-powered Tracdrils, each mounting a 4½-inch deep-hole drill, formed a drilling team that worked two 10-hour shifts sinking 2¾-inch blast holes.

Supplying air to the Tracdrils and to the other equipment at the project site was a battery of CP-600 Power Vane rotary compressors.

For further information write to the Chicago Pneumatic Tool Co., Dept. C&E, 6 E. 44th St., New York 17, New York, or use the Request Card that is bound in at page 18 of this issue. Circle No. 126.

A CP hydraulic drill positioner handles toe-hole drilling on rutted, ice-covered ground. Heavy-duty multiple-disk brakes assure precise hole sinking.





Freezing temperatures were no problem to this Drill-master, shown working in a quarry in northern Vermont—the machine uses no water, but operates entirely by air. On this job, the unit replaced four churn drills. It was used to sink 6-inch blast holes to depths ranging from 75 to 180 feet through a 20 to 25-foot burden, with a 15-foot spacing. Carset bits used with the drill reportedly delivered a total life of up to 4,000 feet of hole. For further information write to the **Ingersoll-Rand Co.**, Dept. C&E, Phillipsburg, N. J., or use the Request Card at page 18. Circle No. 59.

New tail-gate spreader is operated from cab

Continuously variable dual-hydraulic cab controls, which permit the driver to instantly regulate the width and depth of the spread, are the outstanding feature of the new Hi-Way Model TG tail-gate-mounted spreader available from the Highway Equipment Co.

The unit is operated by one man who can choose any spreading width from 5 to 40 feet. A second hydraulic control regulates the flow of all materials.

The Hi-Way Model TG can be installed on any standard dump body measuring 6½ to 8 feet in width. The pump is driven directly off the power take-off, or the supply can be taken from the hoist pump.

Designed for either ice-control or seal-coating work, the Model TG also features a stabilizer bar that keeps the 18-inch-diameter spinner level at all times, regardless of the dump-body angle. The spreader can be mounted in a matter of minutes without the necessity of removing the tail gate from the dump body.

A screw-type auger is designed especially to furnish agitator action to break up frozen lumps of material.

For further information write to the Highway Equipment Co., Dept. C&E, Dept. H-20, 616 D Ave. N.W., Cedar Rapids, Iowa, or use the Request Card at page 18. Circle No. 23.

Transit-mix plant is high-capacity unit

A completely portable high-capacity transit-mix plant called the Gopher is announced by the C. S. Johnson Co.

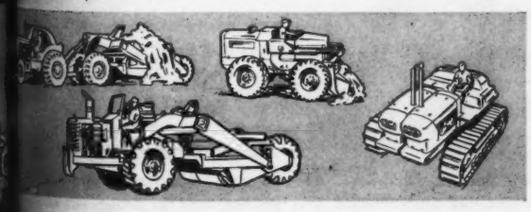
The plant consists of a 40-ton-capacity storage bin divided for three sizes of aggregate; a 6-yard portable weigh batcher with a 24-inch-wide discharge belt bolted to the hopper frame; and a 285-barrel-capacity Porto-Silo complete with 4,000-pound-capacity cement batcher.

The main aggregate bin is of all-welded steel construction with 9-foot-wide sections and fill-gates for charging batcher. The aggregate scale has three 12,000-pound weigh beams. The discharge belt has a capacity of 300 tph.

The Porto-Silo is 8 feet in diameter and has a capacity of 180 barrels per hour.

For further information write to the C. S. Johnson Co., division of Koehring Co., Dept. C&E, P. O. Box 71, Champaign, Ill., or use the Request Card at page 18. Circle No. 84.

you to keep the "stick"



EVEN IF YOU HAVE only top operators on all your equipment, the cost of keeping a stick-shift comes to a pretty penny: too-frequent, high repair bills for unavoidably shock-loaded drive lines and axles—engines being overhauled twice as often as necessary at $1,200 to $1,500 per overhaul—and, of course, those incessant clutch repairs and replacements.

No Operator Matches TORQMATIC Efficiency—

—for no operator can handle the stick as smoothly and efficiently—*every* time—as an Allison TORQMATIC DRIVE.

TORQMATIC adjusts your engine output and speed—automatically—to meet every change in load or terrain. It never fatigues—no matter how long or how tough the job. It needs no costly training—in fact, TORQMATIC owners report they're saving between $1,500 and $2,000 every time they train a driver because rookies can't make a shifting or clutching mistake.

It's Working for You or Against You

So it's easy to see that a TORQMATIC DRIVE is a real money saver. One thing is sure: you're either cashing in on its advantages on every job you bid for—or competing against men who do, who bought TORQMATIC because they looked at *total* cost, not just *first* cost.

And remember—TORQMATIC is available in almost every type—and well over 100 makes—of equipment. It's been proved—on years of tough jobs—far beyond any other hydraulic transmission. Just see your dealer—or write Allison for details.

ALLISON DIVISION OF GENERAL MOTORS
Indianapolis 6, Indiana

In Canada: General Motors Diesel Ltd., London, Ontario

Allison TORQMATIC

TORQMATIC® DRIVES

THE MODERN DRIVE FOR MODERN EQUIPMENT

Built stronger to last longer—Allison casts its converter for extra strength, greater precision —and the converter is *integrated* with the transmission for a neat, easily serviced installation.

For more facts, use Request Card at page 18 and circle No. 339

Drilling bucket bores large-diameter holes

A new tungsten-carbide-equipped drilling bucket designed to bore large-diameter holes in hard shale, sandstone, coral, and other hard formations is announced by Calweld, Inc.

This bucket has 15 tungsten-carbide blocks and 18 chisel points, as well as a fishtail and two chisel points on the cutter bar head. The bucket drill is rotated at a speed of approximately 20 rpm.

The blocks can be adjusted for wear, and both blocks and chisel points are replaceable.

For further information write to Calweld, Inc., Dept. C&E, 7222 E. Slauson Ave., Los Angeles 22, Calif., or use the Request Card at page 18. Circle No. 35.

Portable space heater is indirect-fired unit

When the power is cut off, the fire goes out immediately.

A new indirect-fired portable heater is offered by the Stow Mfg. Co. The Series ID heater blows air around the outside of a completely enclosed combustion chamber, producing heated fresh air instantly and in large volume. Any fumes can be vented out the top, thereby meeting any safety specifications. Ducts can be provided to pipe heat to a specific area for spot heating.

Model S200ID produces 200,000 Btu at a rate of 1,600 cubic feet of warm air per minute; the Model S420ID, 420,000 Btu at a rate of 4,500 cubic feet of air per minute. The S420ID has a built-in thermostat, permitting selection of the desired temperature. No attendant is required since safety controls anticipate practically any emergency.

Both models have a low oil cutoff switch and an electric solenoid shut-off. The ignition is completely automatic.

For further information write to the Stow Mfg. Co., Dept. C&E, 40 Shear St., Binghamton, N. Y., or use the Request Card at page 18. Circle No. 97.

For more data on any item, circle indicated number on card at page 18.

Form SMOOTHER round concrete columns FASTER!

Goodale Expressway, Columbus, Ohio
Engineer: Aldon E. Stelson & Associates
Contractor: Baker & Hickey Construction Company

Reduce finishing time with
SONOCO
Seamless Sonotube®
FIBRE FORMS

Round concrete columns formed with Seamless SONOTUBE Fibre Forms have a smoother continuous concrete surface . . . only a minimum of finishing is required.

Use Seamless SONOTUBE Fibre Forms wherever finished, exposed columns are required. They form better, strip smoother, finish easier . . . save contractors time, labor and money.

And, like regular SONOTUBE Fibre Forms, Seamless SONOTUBE Fibre Forms are lightweight, easy to handle and place, and require only minimum bracing . . . form round concrete columns faster and more economically than any other method.

Besides Seamless, there are these other types of SONOTUBE Fibre Forms to choose from: "A" Coated (standard form for exposed columns); "W" Coated (for unexposed columns); and Encasement Forms (for encasing existing pillars, posts, piles, etc. with concrete).

All Sonoco SONOTUBE Fibre Forms are available in sizes 2" to 48" I.D., in specified lengths or standard 18' shipping lengths. Can be sawed.

Seamless SONOTUBE Fibre Forms, 36" I.D., used on this job. (Forms not stripped in this photo.)

See our Catalog in Sweet's
For complete information and prices, write:

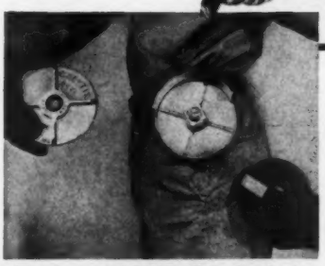
SONOCO
Construction Products
SONOCO PRODUCTS COMPANY

• HARTSVILLE, S. C.
• LA PUENTE, CALIF.
• FREMONT, CALIF.
• MONTCLAIR, N. J.
• AKRON, INDIANA
• LONGVIEW, TEXAS
• ATLANTA, GA.
• BRANTFORD, ONT.
• MEXICO, D. F.

4086

For more facts, use Request Card at page 18 and circle No. 340

To tie re-bars . . .
use
CF&I Cal-Tie Wire
in handy dispenser



The Image of CF&I offers tie-wire in a belt-borne dispenser for safe, quick tying of re-bars. Cal-Tie Wire in the compact reel eliminates the hazards of working with bulky shoulder coils. It prevents eye and facial injuries due to loose coil ends . . . leaves workers' hands free . . . keeps wire from kinking or snagging . . . gets the job done fast . . . cuts wire waste.

Total weight of Cal-Tie Wire and the sturdy dispenser is less than seven pounds. And for strong, sure anchoring of re-bars, Cal-Tie Wire is available in 14- through 20-gage annealed wire. Call the nearest CF&I office for price information and quick delivery.

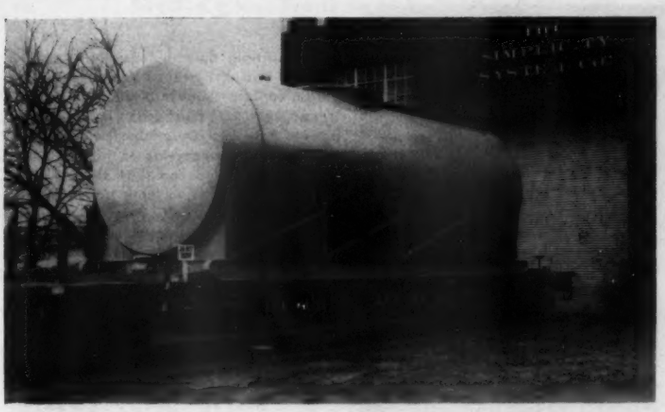
FREE! Send for new 32-page catalog, "CF&I Steel Products for the Construction Industry".

CAL-TIE® WIRE
THE COLORADO FUEL AND IRON CORPORATION

In the West: **THE COLORADO FUEL AND IRON CORPORATION**—Albuquerque • Amarillo • Billings • Boise • Butte • Denver • El Paso • Farmington (N. M.) • Ft. Worth • Houston • Kansas City • Lincoln • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City • San Francisco • San Leandro • Seattle • Spokane • Wichita

In the East: **WICKWIRE SPENCER STEEL DIVISION**—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia • **CF&I OFFICE IN CANADA:** Montreal • **CANADIAN REPRESENTATIVES** Alta Calgary • Edmonton • Vancouver • Winnipeg

For more facts, use Request Card at page 18 and circle No. 341



Only a small portion of this horizontal asphalt storage tank is heated to operating temperature; the remainder of the asphalt in the outer portion of the tank serves as insulation for this "inner well." These quick-heat and insulation features are especially beneficial in cold-weather operations, the manufacturer points out. For further information write to **The Simplicity System Co.**, Dept. C&E, Riverside Drive, Chattanooga 6, Tenn., or use the Request Card at page 18. Circle No. 90.

Coating protects asphalt against winter weather

Jennite J-16, a liquid coating for the protection of asphalt and blacktop surfaces against winter freezing and possible damage from road salts and chemical ice melters, is offered by Maintenance, Inc.

Because it seals out moisture, it reduces cracking and surface crumbling frequently caused by accelerated thawing and freezing cycles, states the manufacturer.

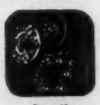
Jennite-coated surfaces are also claimed to be easier to clear of ice and snow than untreated pavements. The manufacturer advises that the black Jennite attracts heat from the sun; this lessens the degree of ice adherence, thus speeding up shoveling or plowing.

For further information write to Maintenance, Inc., Dept. C&E, W. Liberty St. Extension, Wooster, Ohio, or use the Request Card at page 18. Circle No. 61.

ROCKFORD

ROCKFORD CLUTCHES WITHSTAND THE MOST SEVERE SERVICE

Severe Service is possible only through specialized equipment and highly practiced skills—the same that lie behind the quality of every ROCKFORD CLUTCH. Each order is given the extra measure of care that makes ROCKFORD CLUTCH quality a byword in industry. Due to rigidly held specifications covering the chemical analysis of materials, and properly governed heat treatment, the pressure plates used in ROCKFORD CLUTCHES withstand the most Severe Service. We urge your engineers to consider this and other advantages of ROCKFORD CLUTCHES—when engineering your next application of a clutch.



Small Spring Loaded

Heavy Duty Spring Loaded

Oil or Dry Multiple Disc

Heavy Duty Over Center

Power Take-Offs

Speed Reducers

SEND FOR THIS HANDY BULLETIN Gives dimensions, capacity tables and complete specifications. Suggests typical applications.

ROCKFORD Clutch Division BORG-WARNER

314 Catherine St., Rockford, Ill., U.S.A.

Export Sales Borg-Warner International — 36 So. Wabash, Chicago 3, Ill.

CLUTCHES

For more facts, use Request Card at page 18 and circle No. 342

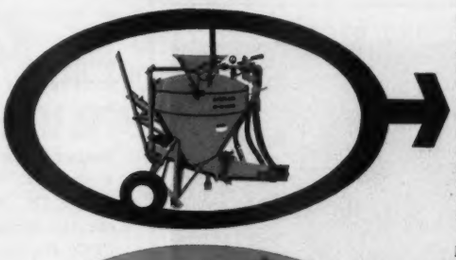
YOU GET SO MUCH MORE FROM

AIRPLACO

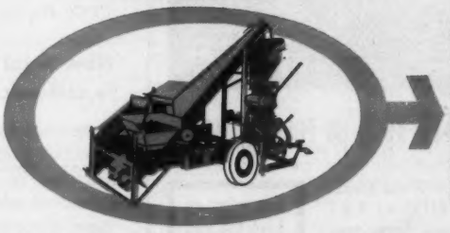
THE ONLY COMPLETE LINE OF PNEUMATIC CONCRETE PLACING EQUIPMENT

More versatility . . . more efficiency . . . more economy . . . more jobs done better, faster and easier. That's what you can expect from Airplaco equipment. From the simplest concrete repair or restoration job to the largest construction project, Airplaco equipment means more profit to you.

AIRPLACO BONDACTORS AND NUCRETORS. With five models to choose from, you can gun concrete at any rate from ½ to 8 cu. yd. per hour. Airplaco guns are adjustable to a variety of materials including concrete, refractories and insulating concretes. There is an Airplaco gun just right for your needs.



AIRPLACO CONCRETE PLACERS. The new, low-cost way to place and distribute structural concrete. Two models give you production range up to 30 cubic yds. of material per hour. Concrete is conveyed through lightweight placement tubing to any point on the job. Serves equally well in grouting operations. Save many man hours with this flexible new method.



AIRPLACO MIX-ELVATORS. Automatic proportioning, mixing and elevating equipment. Three models deliver up to 12 cu. yds. of mix per hour. One model has built-in aggregate dryer that reduces moisture content of sand. Teamed up with an Airplaco gun, the Mix-Elvator gives you a most efficient and mobile gunning rig.

Let Us Help You Solve Your Concrete Problems

Our experience in solving unique problems involving the handling of concrete has saved thousands of dollars for others. This experience is available to you. Write, wire or phone us, anytime.

WRITE FOR FREE CATALOG

THE AIRPLACO LINE ALSO INCLUDES: CONCRETE GROUTERS—JET-BLASTER (wet or dry) SANDBLASTERS — Complete Line of Hose, Nozzles and Accessories

AIRPLACO AIR PLACEMENT EQUIPMENT CO.

1007 WEST 24TH ST. • KANSAS CITY 8, MO.

WORLD'S LEADING MANUFACTURER OF "ADVANCED DESIGN" PNEUMATIC PLACING EQUIPMENT

For more facts, use Request Card at page 18 and circle No. 343

Tough, airtight polyethylene film is shown here in use as a barrier to freezing temperatures as freshly placed concrete goes into the curing stage. The job is an approach to Pittsburgh's Fort Pitt double-decker bridge. Panels of Durethene polyethylene film are in place on the underside of the roadbed, with tarpaulins on top to complete the bundling of the newly placed concrete. Both transparent and black film, new and re-used, were used here. Portable ground heaters sent heat through the 3-way hose to warm the interior. When the mercury dropped to freezing or below, the heaters were kept going around the clock by workmen of the John F. Casey Co., contractors on the project. For further information on Durethene, write to the **Koppers Co., Inc.**, Plastics Division, Dept. C&E, Koppers Bldg., Pittsburgh 19, Pa., or use the Request Card at page 18. Circle No. 16.

New snowplow features tripping subframe

A new, reversible trip-blade snowplow is available from Wausau Iron Works.

This plow features a tripping subframe that clears obstructions without damage to plow or truck. Other features include full oscillation to follow road contour; easy adjustment for moldboard pitch; and adjustable push plates to compensate for difference in truck-frame heights.

For further information write to the Wausau Iron Works, Dept. C&E, 738 S. Tenth Ave., Wausau, Wis., or use the Request Card at page 18. Circle No. 92.

***NOX-CRETE FORM COATING**

* Trade Mark registered U. S. Patent Office. © Industrial Lubricants, Inc.

. . . it's the first major form coating improvement in many years and, as a contractor you owe it to yourself to try it

HERE'S WHY: Unlike ordinary Form Oil or Paraffin Oil—NOX-CRETE Form Coating reacts instantly, at any temperature above freezing, with concrete mix to form a waterproof film between the form and the concrete. While wet this film provides an escape route for air, and later is absorbed by the form—imparting waterproof qualities to wood, and rust preventative qualities to steel.

- Cost of hand scraping or power brushing of forms is eliminated.
- Life of plywood form work is greatly extended.
- Results in a smooth high white flat concrete surface essentially free from voids.
- Appearance and acoustical values are much improved and paint and cement coatings adhere very well to the cured surface.
- Sprays easily even at below freezing temperatures and covers at least 20% more surface than Paraffin Oil.

DISTRIBUTORS LOCATED IN PRINCIPAL CITIES THROUGHOUT THE UNITED STATES

INDUSTRIAL LUBRICANTS, INC.

20th and William Street Omaha, Nebraska

For more facts, circle No. 344

New stabilizer plants are completely portable

Two new portable plants for the production of stabilized road materials have been developed by Pioneer Engineering.

Complete mobility is obtained in both plants, designated Models 425P and 425PX, by the use of pneumatic-tire chassis on which the plant components are mounted.

While both models have an 85-cubic-foot pugmill, 350-gpm water system, and double-clam truck-loading hopper, they differ in that a reciprocating plate feeder and 36-inch-wide conveyor are also offered with the 425P plant, which is mounted on a double-axle main frame. A single-axle frame with fifth wheel carries the Model 425PX. Both plants have a 7-foot minimum clearance under the truck-loading hopper, and both come equipped for on-plant power (power unit optional).

The Model 425P can be adapted for dozer feed by the addition of a folding tail section to the plant conveyor, and by relocating the feeder on the ground. Both models can be adapted for production of asphalt emulsion or cutback mixes by the addition of a bitumen pumping system.

For further information write to Pioneer Engineering, division of Poor & Co., Inc., Dept. C&E, 3200 Como Ave. S. E., Minneapolis, Minn., or use the Request Card at page 18. Circle No. 87.

TRENCHES

2¾" to 8" wide • Depths to 6'

Self-Propelled•Hydraulic Drive

Low Cost • Pays for Itself!

The economic Arps Model M-A Trench-Devil will handle most of your trenching jobs faster, easier and at lowest cost per foot of trench. For the largest percentage of ditching work—foundations, water services, underground wiring, gas lines, sprinkler systems — this heavy duty, one-man outfit will outdig larger units costing many times its low price. Get more information *now* on this and other famous Arps Trenchers for larger and smaller jobs. The Arps Corporation, New Holstein, Wis. Dept. C&E.

ARPS CORPORATION NEW HOLSTEIN, WIS.

TRENCHERS
HALF-TRACKS • BULLDOZERS
UTILITY BLADES

For more facts, circle No. 346

Mr. Harold Bergrave
Superintendent of Transportation
The Washington Water Power Co.
Spokane, Washington

"KIM HOTSTARTS keep us ready to roll"

Like The Washington Water Power Company, KIM HOTSTART engine preheaters will keep your equipment ready to go when the temperature is low. KIM Hotstarts plug into electric circuit when trucks are idle, draw off cold water, heat it, and circulate it back through the engine. High corrosion resistance. Fits gas or diesel engines. See your automotive supplier or write to us....

KIM Hotstart

KIM HOTSTART MFG. COMPANY
West 917 Broadway Avenue Spokane 1, Washington

For more facts, circle No. 345

New level rod announced; is self-calculating unit

The Henderson self-calculating level rod is offered by Planetics Engineering, Inc.

The rod prorates grades and elevations, eliminating the figuring of elevations, cuts and fills, grade rods, and other problems. It establishes grades and elevations on vertical, as well as horizontal, surfaces. According to the manufacturer, cold or rain will not impair the unit's operation.

For further information write to Planetics Engineering, Inc., Dept. C&E, 10819 Sessler St., South Gate, Calif., or use the Request Card at page 18. Circle No. 137.

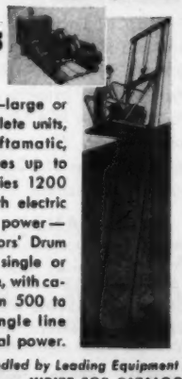
SAFE • SPEEDY • DEPENDABLE

Derricks For every contractor's need —Stiff-Leg, Guy Line, Setter, A-Frame, Pole and Tripod, Roofers' Circle Swing Derricks... hand and/or power operated. Proved performers on every type of job. Safe and dependable.

"PROVED IN SERVICE"

Sasgen

Hoists Made to fit your requirements—large or small. Complete units, like the Liftamatic, which reaches up to 90 ft., carries 1200 lb. load with electric or gasoline power—or Contractors' Drum Hoist Units, single or double drum, with capacities from 500 to 5500 lb. single line pull. Optional power.



Winches From U. L. approved safety scaffold winches to heavy-duty hand-powered winches that will take from 400 to 40,000 lb. loads, Sasgen has a complete line to handle your job quickly and safely. You can't buy a better winch!

Handled by Leading Equipment Distributors Everywhere

WRITE FOR CATALOG AND PRICES

Sasgen DERRICK COMPANY

3127 W. GRAND AVE. • CHICAGO 22, ILLINOIS

For more facts, circle No. 347

With the Schwartz ramp hoist, one man can load equipment onto truck beds and also handle unloading.

Ramp hoist for low-beds loads, unloads machines

Mounted on either a single or tandem-axle truck, the Schwartz ramp hoist enables one man to load, transport, and unload equipment.

A powerful winch, located at the front of the ramp and operated off the power takeoff of the truck, pulls the equipment onto the ramp. The hydraulic hoist reportedly will handle up to 12 tons with ease. All the hydraulic and power-takeoff controls are located at the side of the ramp, allowing the operator full view of loading and unloading operations.

The Schwartz ramp hoist fits all trucks measuring from 84 up to 154 inches, cab to axle, and is designed so that the truck-frame cross member is not removed when the ramp is mounted.

For further information write to the Schwartz Mfg. Co., Dept. C&E, Lester Prairie, Minn., or use the Request Card at page 18. Circle No. 144.

Portable heater delivers 220,000 Btu per hour

A portable heater that delivers 220,000 Btu per hour has been added to the Master Vibrator Co. line.

Called Model B-320, the new heater will run for 16 hours on a tank of kerosene or fuel oil. It has a thermostat for safe, automatic operation and plugs into any regular 115-volt ac outlet. According to the manufacturer, the B-320 burns the fuel so completely that no vent is needed. An automatic fan cutoff control allows the combustion chamber to cool before turning off the fan.

One man can wheel the B-320 around easily, and it will go into most tight spots without trouble.

For further information write to the Master Vibrator Co., Dept. C&E, 1732 Stanley Ave., Dayton 1, Ohio, or use the Request Card at page 18. Circle No. 65.

Seeded grass blankets help fight soil erosion

Seeded grass blankets that can be easily rolled out and tamped down are announced by Troy Blanket Mills.

Known as Troy Turf, the blankets consist of a 4-ounce jute with a bottom layer of special paper, and they contain seed, fertilizer, Ph control, vermiculite, grub-control agents, and organic mulch said to provide a distribution of 3½ tons per acre.

According to the manufacturer, the blankets will grow grass without special soil preparation and are particularly suitable for areas where soil erosion or gullying is a problem.

For further information write to Troy Blanket Mills, Dept. C&E, 200 Madison Ave., New York, N. Y., or use the Request Card at page 18. Circle No. 91.

CUT YOUR LOADING COSTS WITH NEW 5 Yd. LIMA LOADER

5 MACHINES IN 1! converts in field to shovel, crane, dragline or pullshovel
FLEXIBLE! digs, scoops, swings and loads in full circle
ELIMINATES WASTE MOTION
CUTS WIDE 8-Ft. SWATH

NEW LIMA UNIT GIVES TOP LOADER PRODUCTION WITH SHOVEL EFFICIENCY...
serves as excavator, materials handler

The new Lima Loader, with giant 5-yd. bucket, moves more dirt and materials faster and more profitably.

These are the reasons — long horizontal crowding action; big 5-yd. capacity bucket; full swing versatility; high-speed digging and loading from stationary position.

NO WASTE MOTION

Powerful 9-ft., 10-in. horizontal crowding action assures maximum loading at every 5-yd. bite . . . even when handling wet materials. Bucket is completely filled without moving machine; results in less travel wear, lower maintenance and fuel consumption.

For maximum versatility, the Lima Loader is mounted on basic Lima 64 crawler type machine. It operates at top efficiency, hour after hour, from a stationary position, no time-wasting maneuvering with each load. Unexcelled full-swing digging and loading at any point of the compass means high production . . . higher profits!

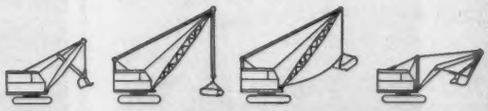
Actually the Lima Loader is 5 machines in 1. It can be speedily converted in the field to a 1¼ or 1½-yd. *shovel*, 40 or 50-ton *crane*, 1¼ or 1½-yd. *pullshovel*, or variable capacity *dragline*.

Other important operational features of the Type 64 Lima Loader include hydraulically controlled bucket which raises to 25-ft., 6-in., permitting 16-ft., 10-in. clear dumping height at 18-ft. radius. The bucket tilts to 52 degrees for complete emptying. 8-ft. wide bucket, with removable teeth, cuts accurately and evenly on sloping banks as well as level ground. Independent travel, optional equipment, but recommended with loader. Torque converter matches power to digging resistance; eliminates engine stalling.

PRECISION AIR-CONTROLLED

The main and auxiliary machinery is precision air-controlled for amazingly easy operation without fatigue.

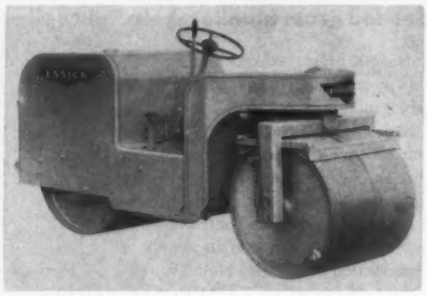
See your nearest Lima distributor today or write Baldwin-Lima-Hamilton Corporation, Construction Equipment Division, Lima, Ohio, for full information on the 5-yd. Lima Loader — the newest addition to Lima's famous line of high-quality construction equipment.



Shovels to 6-yd. Cranes to 110-tons Draglines, variable Pullshovels to 2½-yd.

LIMA Construction Equipment Division, Lima, Ohio
BALDWIN · LIMA · HAMILTON
Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment
5956

For more facts, use Request Card at page 18 and circle No. 348



The new Essick 310 tandem roller is described as a unit of tough heavy-duty construction, with great stability, portability, maneuverability, and maximum visibility.

Tandem rollers offered in 2, 3-ton capacities

Two new heavy-duty tandem rollers have been announced by the Essick Mfg. Co.

Redesigned and re-engineered from the ground up, the new Essick Model 310 roller replaces the previous Model 300, 3-ton tandem roller. The new model features a lower profile, wider rolls, and new steering arrangement.

Tough heavy-duty construction ensures long life and superior performance, according to the manufacturer. Equipped with what is reported to be the largest-diameter guide roll of any comparable roller, the Model 310 is said to produce perfect surfaces as it rolls on top of — rather than pushing forward — the soil or asphalt.

A completely redesigned 2-ton tandem—the Model 210—is also offered by the company.

For further information write to the Essick Mfg. Co., Dept. C&E, 1966 Santa Fe Ave., Los Angeles 21, Calif., or use the Request Card at page 18. Circle No. 146.

New electric vibrator features 1-inch head

A new electric concrete vibrator, with a 1-inch, abrasion-resistant head, is announced by Vibro-Plus Products, Inc.

Known as Model ESV-25, the unit offers frequencies ranging from 8,000 to 12,000 vpm and head lengths from 10 to 18½ inches.

For further information write to Vibro-Plus Products, Inc., Dept. C&E, Stanhope, N. J., or use the Request Card at page 18. Circle No. 14.

Traveling shore crane is versatile unit

A firm in the Netherlands has developed a new type of traveling shore crane for quick and efficient loading or unloading at plant, railroad, canal, or river sidings, as well as special on-the-job needs.

The box construction of the supports features boxlike units surmounted by the operating cabin and boom. The end of the boom is provided with counterweights, which facilitates tipping down to the ground for lubricating the rope pulley.

The hoisting, tipping, swinging, and traction engines are mounted as units in readily accessible places for quick inspection and maintenance.

For further information write to The Netherlands Trade Commission, Dept. C&E, 551 Fifth Ave., New York, N. Y., or use the Request Card at page 18. Circle No. 145.

The hoisting, tipping, swinging, and traction engines are mounted as units in readily accessible places for quick inspection and maintenance.

How Standard Oil Provides Support For A Bridge Builder

Dravo Corporation builds Mississippi River span at Bettendorf, Iowa, gets lubricants, fuels and technical service from Standard Oil

Safety brake permits fast, smooth stops

A braking device said to employ the power of exhaust gases to smoothly and rapidly decelerate even massive payloads is announced by the Power Brake Equipment Co.

This device neither relies on nor otherwise influences any installed braking system, states the manufacturer. It is suitable for retarding the motion of cranes, winches, well diggers, and similar stationary equipment powered directly by internal-combustion engines.

The stainless-steel unit, easily installed on the engine manifold, converts each cylinder in the power plant into an individual low-pressure (40 to 50-psi) air compressor. As long as the engine turns over, each cylinder continues its positive braking action.

For further information write to the Power Brake Equipment Co., Dept. C&E, 1623 E. 11th Ave., Portland, Ore., or use the Request Card that is bound in at page 18 of this issue. Circle No. 77.

This Cedarapids Super Commander plant is equipped with a Model 1236 twin jaw crusher, Model 3025 roll crusher, and a 48-inch×14-foot triple-deck horizontal vibrating screen.

Crushing, screening plant has 500-tph capacity

A new Cedarapids tandem crushing and screening plant is announced by the Iowa Mfg. Co. Called Super Commander, the unit has a capacity of up to 500 tph of 1 to 4 product sizes.

Important features are the 12×36-inch twin jaw crusher and the 48-inch × 14-foot horizontal triple-deck vibrating screen.

When necessary, the plant can be fitted with a third air-suspension axle that will carry a load equal to the tandem axles and reduce axle load to under 18,000 pounds. With the feeder and hopper removed, weight on each of the three axles is under 16,000 pounds.

The plant can be fed by a plant-mounted feeder and hopper or by a ground-level feeder and hopper driven by a swivel drive. It can be fitted with a spraybar washing attachment to produce washed aggregate and a 12-inch-diameter by 4-foot-6-inch-long sand ejector screw to handle wet or dry sand.

For further information write to the Iowa Mfg. Co., Dept. C&E, 916 16th St. N. E., Cedar Rapids, Iowa, or use the Request Card at page 18. Circle No. 122.

Powerful new explosive needs no extra priming

A new explosive is announced by the Austin Powder Co.

Known as Apcomite, it is said to produce greater explosive power per foot of loaded blast hole and to eliminate most shipping, storage, mixing, and material-handling problems. Also, it incorporates specially processed ammonium nitrate with a primer that eliminates the need of extra priming.

Apcomite is available in two types that are ready to load and shoot. Apcomite 17 is for all normal usage while No. 20A, with greater density, is for wet holes. Both are furnished in 23G tubes, in 5-inch and larger diameters.

For further information write to the Austin Powder Co., Dept. C&E, 450 Rockefeller Bldg., Cleveland 13, Ohio, or use the Request Card at page 18. Circle No. 138.

←For more facts, circle No. 349

End of a bottleneck. New 5,504 ft. bridge will be supported by 35 concrete piers, 11 in water and 24 smaller ones on land plus abutments and two anchorage piers.

The new, two lane span Dravo is building is an addition to the two lane bridge 72 feet upstream which, until now, has carried all of the U.S. Highway 6 traffic across the Mississippi. Right there to lend support to Dravo is Standard Oil.

Standard Oil storage facilities for the fuels and lubricants are located at Davenport, less than ten miles from the construction site. Standard's Harold Jansen lives in Davenport. He's nearby at all times to render lubrication technical service.

Here's what this means to the contractor: Inventories of lubricants and fuels at the job can be kept to a minimum, yet there is never any waiting for supplies of these products. A trained engineer with ten years' experience in such work is on hand to help maintenance men get the best possible service from equipment. The men who are operating equipment on the job can depend upon the lubricants, greases and fuels being the very top in quality.

Is this the sort of service you want from a supplier? Get it by calling the Standard Oil lubrication specialist near you. There are 48 Standard Oil district offices and nearly 3,600 storage and warehouse points in the 15 Midwest and Rocky Mountain states served by Standard. One of them is near your job wherever you are. **Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.**

STANDARD

You expect more from Standard and you get it!

Harry Kraus, Dravo superintendent, and Standard's Harold Jansen have a look at the lubrication literature. Harold Jansen knows his way around a construction site. He's been doing work of this kind for ten of the thirteen years he's been with Standard. Harold has special diesel training and has completed Standard's Sales Engineering School.

The Model STT-80 semitrailer sprinkler tank has an 8,000-gallon water tank. Front, rear, and gravity spraybars deliver 1,500 gpm.

New sprinkler tank is semitrailer unit

The Southwest Welding & Mfg. Division of Yuba Consolidated Industries, Inc., announces the Model STT-80 semitrailer sprinkler tank. The unit is designed for use behind Caterpillar DW21 and DW20 tractors.

The 8,000-gallon tank has front, rear, and gravity spraybars capable of delivering 1,500 gpm with a spray swath of 55 feet. Nozzles on front and rear pressure bars are manually adjustable for regulating direction of spray and volume of flow.

Air-actuated valves, operated from the driver's position, control water flow. Duck-bill-type spray pots are also available.

Two loading systems are offered: either from an overhead standpipe through a top inlet or by a suction-valve arrangement. Large earthmover tires provide adequate flotation for operation in soft earth fills.

For further information write to Southwest Welding & Mfg. Division, Yuba Consolidated Industries, Inc., Dept. C&E, 3201 W. Mission Road, Alhambra, Calif., or use the Request Card at page 18. Circle No. 37.

Firm makes available small-size space heater

A small-size Hot-Shot 75,000-Btu space heater is offered by the Kelley Machine Division of the Wiesner-Rapp Co., Inc.

The new unit is thermostatically controlled and shuts off automatically if fuel gets low. The fuel tank permits up to 12 hours of continuous operation.

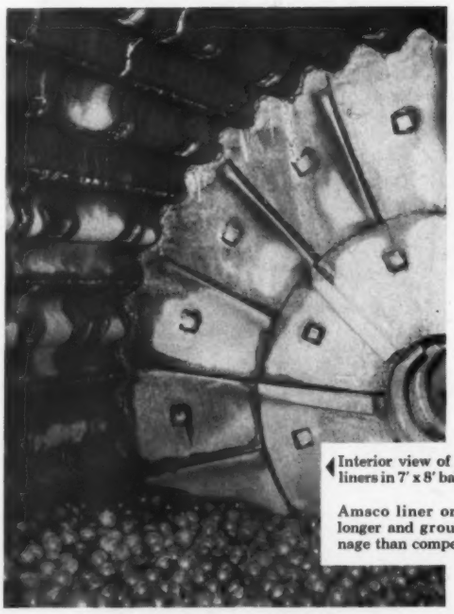
For further information write to the Kelley Machine Division, Wiesner-Rapp Co., Inc., Dept. C&E, 283 Hinman Ave., Buffalo 23, N. Y., or use the Request Card at page 18. Circle No. 62.

Capacities to 3,000 gpm in submersible pump line

A new line of Flygt fully submersible electric-powered pumps is offered by the Stenberg Mfg. Corp. Pumping unit and motor are enclosed in a single frostproof unit. Six models provide capacities up to 3,000 gpm and handle heads to 220 feet.

For further information write to the Stenberg Mfg. Corp., Dept. C&E, Hoosick Falls, N. Y., or use the Request Card that is bound in at page 18 of this issue. Circle No. 121.

How AMSCO helps you HANDL



Interior view of Amsco double wave liners in 7' x 8' ball mill, using 2" balls.

Amsco liner on left lasted 123% longer and ground 134% more tonnage than competitive liner on right.

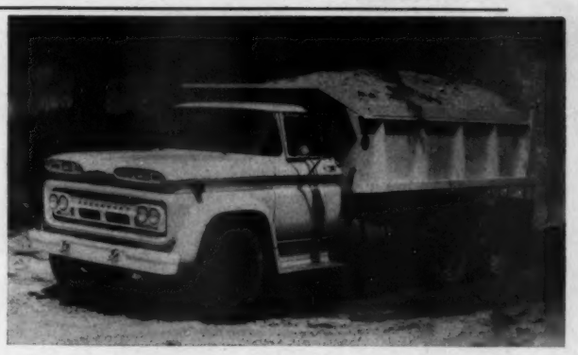
Bucyrus 88 D four-yard bucket, equipped with Amsco Simplex 2-part Teeth, removing rock for power station. All of Tuscarora Constructors' shovels used for rock excavation are equipped with Amsco Simplex Teeth.

frost wedge available in three shank sizes

The Brunner & Lay frost wedge, for use with pneumatic hammers, is offered in shank sizes of 1×4½ inches; 1⅛×6 inches; and 1¼×6 inches. Length under collar on all three is 17½ inches. Wedge sizes are 1½×12 inches on the first tool and 1×12 inches on the other two.

For further information write to Brunner & Lay, Inc., Dept. C&E, 9300 King St., Franklin Park, Ill., or use the card at page 18. Circle No. 100.

A suspension system offering increased capacity, improved durability, and greater stability is a major feature of the 1960 Chevrolet tandem truck line. Front wheels are individually suspended with torsion rod springs. The new 30,000-pound rear bogie has matched higher-capacity axles and utilizes the Hendrickson tandem drive system that features simplified design, lighter weight, and reduced maintenance. Drive to the rear axle is provided through an inter-axle differential with a lockout that provides maximum traction under difficult conditions. For further information write to the Chevrolet Motor Division, **General Motors Corp.**, Dept. C&E, General Motors Bldg., Detroit 2, Mich., or use the Request Card at page 18. Circle No. 50.



NDLORE TONS PER DOLLAR

Read how AMSCO Mill Liners and Dipper Teeth are outlasting competitive parts in severe service

AT A LARGE NEW YORK ZINC MINE...

THEY'VE DOUBLED SERVICE LIFE WITH AMSCO CHROME-MOLY BALL MILL LINERS

Amsco double wave chrome-moly liners are used on an Allis-Chalmers 7′ x 8′ ball mill at this large northern New York zinc mine. The mill is operating *24 hours a day, six days a week*... grinding rod mill discharge consisting of sphalerite, pyrite and the balance silicate and limestone gangue.

These Amsco liners ground 670,000 tons during their 29-month life... as against an average of 286,000 tons and 13-month life for the type of liners previously used. That adds up to over *100% increase in service life*. In addition to their longer life, another fact that impresses the operators about Amsco liners is that there's no circumferential grooving until the very end of their service life.

TUSCARORA CONSTRUCTORS HAVE FOUND...

AMSCO 2-PART DIPPER TEETH ARE "BEST-WEARING TEETH WE'VE EVER USED"

At the Niagara Power Project, Tuscarora Constructors are building the power station and pumping station. They're digging almost entirely in rock, working their dippers 24 hours a day, six days a week.

Dell Lundmark, Equipment Superintendent for Tuscarora, was responsible for selecting Amsco 2-part reversible teeth for his dippers. He'd heard of their fine performance elsewhere, and now describes them as the "best wearing teeth we've ever used". He says the design of the teeth is very good for rock, and adds, "We're getting *15% to 20% longer wear* than from competitive 2-part teeth".

Approximately 10,000 tons of rock are handled before the teeth are turned over ... and tips are easy to replace when completely worn.

This combination of a new alloy steel, plus the design features engineered into the Amsco Simplex Teeth, are causing equipment superintendents everywhere to change to Amsco for better, lower cost digging.

AMERICAN Brake Shoe COMPANY

AMSCO

American Manganese Steel Division • Chicago Heights, Ill.

Other Plants in: Denver • Los Angeles • New Castle, Dela. • Oakland, California • St. Louis

In Canada: Joliette Steel and Manitoba Steel Foundry Divisions

New coating material for concrete forms

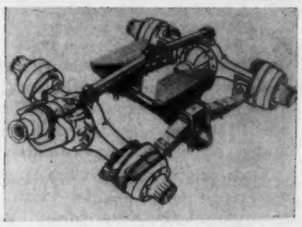
Nox-Crete form coating, a compound said to react chemically with concrete mix to prevent bonding between the poured concrete and the inner surfaces of forms and molds, is available from Industrial Lubricants, Inc.

According to the manufacturer, the coating reacts instantly to deactivate the surface bonding of concrete while in the wet stage, resulting in uniformly clean, smooth, high-white, flat surfaces, essentially free from voids. It may be sprayed, swabbed, or brushed, even at temperatures below freezing. It is said to work equally well on all types of concrete forms and molds, and to be particularly effective as a bond breaker for tilt-up forms and shell structures.

For further information write to Industrial Lubricants, Inc., Dept. C&E, 20th and William, Omaha, Nebr., or use the Request Card at page 18. Circle No. 11.

Tandem suspension unit for trucks and tractors

A new lightweight tandem suspension unit for trucks and tractors has been announced by the Transmission and Axle Division of the Rockwell-Standard Corp.



Two versions are offered. The all-steel unit provides weight savings up to 230 pounds; equipped with aluminum frame support brackets and torque rods, it saves an additional 80 pounds.

According to the manufacturer, the unit requires minimum maintenance. Easy removal of either axle is another feature.

For further information write to the Transmission and Axle Division, Rockwell-Standard Corp., Dept. C&E, Detroit 32, Mich., or use the Request Card at page 18. Circle No. 135.

←For more facts, circle No. 350

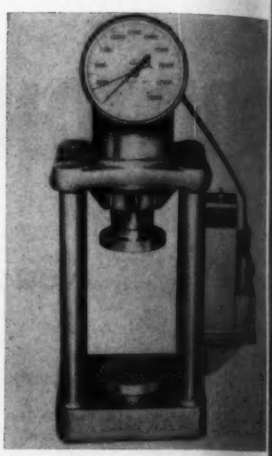
Digging out a 12-inch snowfall in the paralyzed downtown area of Waukegan, Ill., this Payloader Model HH is equipped with a triple-auger rotary snowplow. According to the manufacturer, the unit took less than 60 seconds to load out a 10-cubic-yard truck, thus keeping nine city trucks busy on the shuttle haul cycle that cleared the way for normal traffic. For further information on Payloaders, write to **The Frank G. Hough Co.**, Dept. C&E, 822 Seventh Ave., Libertyville, Ill., or use the Request Card at page 18. Circle No. 17.

For further information on any product described in this section, circle the indicated number on the Request Card at page 18.

Portable concrete tester has 125-ton capacity

A new 250,000-pound-capacity portable concrete-testing machine is announced by Soiltest, Inc.

Designated Model CT-710, the unit can be used in a central laboratory or in field applications. It is designed for testing standard 6x12-inch cylinders and also for testing beams, 2-inch cubes, concrete blocks and other concrete specimens when the proper attachments are used.



This tester is entirely self-contained, and no pressure or electrical connections are required for operation. All loads are developed by double-piston hand-operated pump. Loads are read on an 8-inch-diameter pressure gage that is equipped with a maximum load pointer.

The machine measures 38 inches high and has a width of 21 inches including the pump assembly.

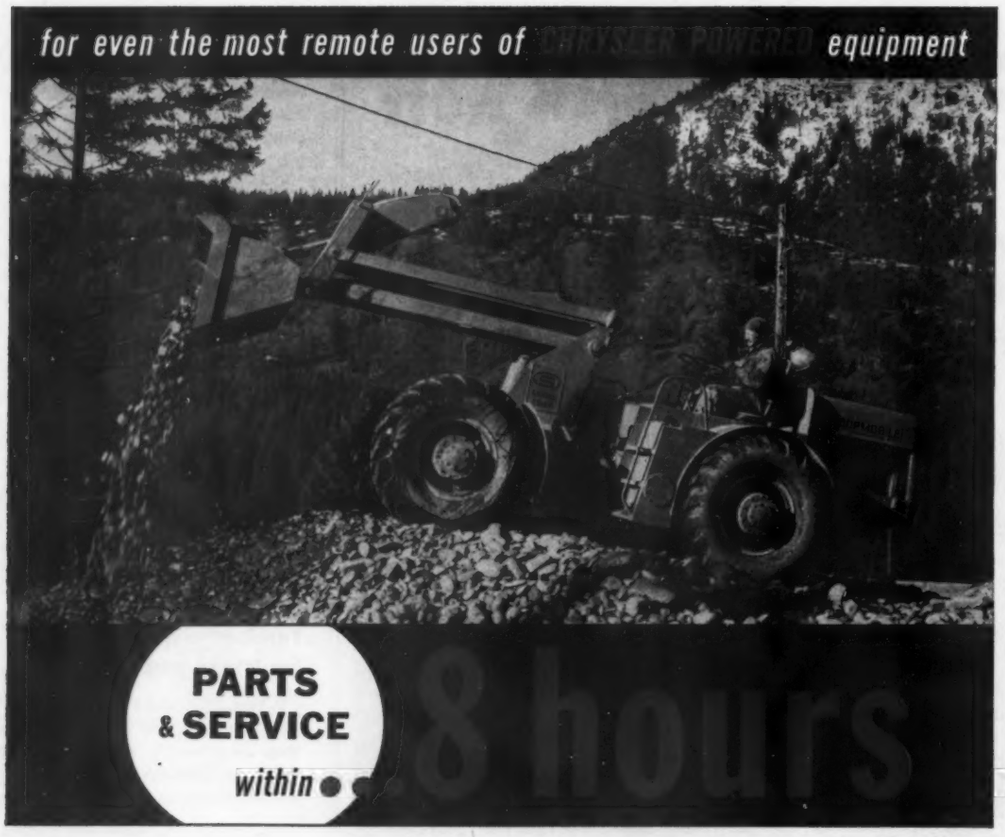
For further information write to Soiltest, Inc., Dept. C&E, 4711 W. North Ave., Chicago 39, Ill., or use the Request Card at page 18. Circle No. 25.

Vertical plan file holds 150 sheets per foot

The Plan Hold Corp. announces a redesigned vertical file for single sheets, said to combine the advantages of vertical filing with the convenience of handling only one sheet at a time. According to the manufacturer, 150 individual sheets up to 42 inches wide can be filed in one linear foot.

Each sheet is attached to its own aluminum hanger with aluminum-foil adhesive fasteners. The hanger is notched to fit a special rack, which can be mounted on the wall at the height determined by the length of the sheets to be filed. Once inserted in the rack, the hanger is secure.

For further information write to the Plan Hold Corp., Dept. C&E, 8200 Chakemco St., South Gate, Calif., or use the Request Card at page 18. Circle No. 63.



Costly down time has been virtually eliminated for users of Chrysler-powered equipment by the establishment of new Chrysler engine centers and the expansion of Chrysler's dealer network. There are now 40 strategically located engine centers, 350 dealers in the United States. Almost 400 service outlets.

Each engine center has a large and complete inventory of parts and replacement engines—with special delivery trucks operating throughout the area. Many even operate private airplanes for emergency service and parts delivery. Each engine center also has the service buildings, tools and trained engine specialists to provide service for all types of Chrysler-powered equipment.

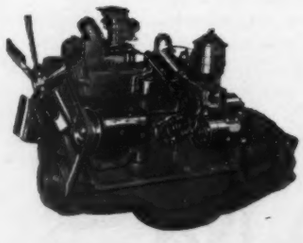
This is the fastest, most efficient parts and service set-up in the industry. It is the best insurance you can get against costly down time losses. It is also one of the big reasons why, today, demand for Chrysler Industrial Engines is at an all time high.

NOW AVAILABLE FROM CHRYSLER—DIESEL ENGINES, 9 to 300 h.p. (16 models)

CHRYSLER

MARINE AND INDUSTRIAL ENGINE DIVISION
CHRYSLER CORPORATION • DETROIT 31, MICHIGAN

CHRYSLER-POWERED SCOOPMOBILE (above) owned by Falls Ready-Mix, Inc., Thompson Falls, Montana is working on a 949-foot steel and concrete bridge over the Clark Fork River. Even in this remote region Rex Denison, owner, is assured of Chrysler parts and service within 8 hours—virtually eliminating costly down time. Equally important, Mr. Denison says, "Chrysler engines give us efficient, trouble-free performance with plenty of reserve power."



CHRYSLER IND. 32 (265 cu. in. displacement). Other Chrysler models 230 to 354 cu. in. displacement.

For more facts, use Request Card at page 18 and circle No. 351

One-man earth compactor is multi-utility unit

Safety, versatility, and easy maintenance are said to be major characteristics of the new Rapak self-propelled, one-man earth compactor offered by Racine Hydraulics & Machinery, Inc.

The self-contained unit requires no auxiliary equipment; this provides handling ease and safety for the operator, plus greater mobility.

Powered by a 4-cycle 3-hp gas engine, the unit has an adjustable rate of from 400 to 600 blows per minute. It operates in either cohesive or granular soils and will compact cohesives through granular soil to over 95 per cent Proctor density, according to the manufacturer.

Interchangeable shoes give the compactor a range of working widths from 6 to 18 inches.

For further information write to Racine Hydraulics & Machinery, Inc., Dept. C&E, 2000 Albert St., Racine, Wis., or use the Request Card that is found in at page 18 of this issue. Circle No. 29.

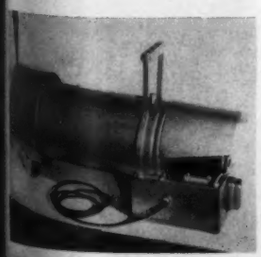
New LPG space heater rated at 200,000 Btu

The Muller Machinery Co., Inc., announces a new LPG forced-heat space heater rated at 200,000 Btu.

The 45-pound unit includes a burner control that quickly turns off the fuel if the power should fail or the flow of gas be interrupted for any reason. The heater can be set up in a few minutes, according to the manufacturer. An accurate thermostat is an optional extra.

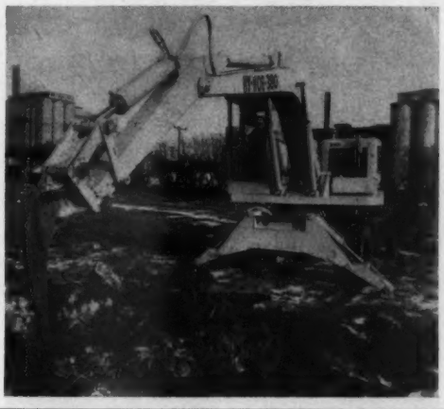
The operator has complete control of the desired heat output, merely turning the valve handle to regulate from 0 to 200,000 Btu. The burner is easily accessible for igniting and checking.

For further information write to the Muller Machinery Co., Inc., Dept. C&E, P. O. Box 248, Metuchen, N. J., or use the Request Card at page 18. Circle No. 64.



For more facts, circle No. 352→

Designed primarily for excavating frozen soil, the frost-point attachment for the Hy-Hoe backhoe is interchangeable with the bucket and can be installed on the machine in the field without special tools. The attachment weighs approximately 200 pounds, is equipped with an interchangeable tooth, and is fabricated from 1¾-inch hot-rolled plate. For further information write to the **Hydraulic Machinery Co.,** Dept. C&E, 4685 W. Electric Ave., Milwaukee 46, Wis., or use the Request Card at page 18. Circle No. 74.



"The Cedarapids Bituminous Paver
MAKES EVERY OTHER PAVER OBSOLETE"*

- **Paves Faster**—"About four times faster than other pavers. We can get the job done quicker and at less cost."
- **Lays Perfect Mat**—"We save time and money because we don't have to go over rough spots. It takes less rolling because of the Cedarapids vibrating screed. On our Philadelphia International Airport job, we got 98% compaction."
- **Easier to Operate**—"Take a look at that control console and you'll see why I say it's so easy to operate. Why, my 12-year old daughter could operate that machine . . . in fact, she has!"
- **Less Maintenance**—"The Cedarapids Paver has ⅓ less wearing parts than others. There's less to go wrong, so we cut down on maintenance."

***That's what Paul Skelly of James J. Skelly, Inc. says about their Cedarapids Bituminous Paver**

James J. Skelly, of Media, Pennsylvania, has been a paving contractor for 55 years. He and his son Paul bought the first automatic bituminous paver in the East, and have used various makes since. They *know* bituminous paving and what a paver should do!

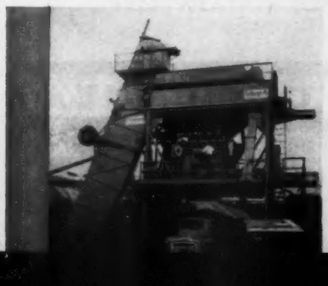
After operating their first Cedarapids Bituminous Paver, bought in early 1958, they used another to help handle the job of laying 27,000 tons in 15 working days at Philadelphia International Airport. As the mixing plant couldn't keep up, Skelly ended up getting material from three plants and completed the job way ahead of schedule.

Do *you* want the detailed story about the Paver that has revolutionized bituminous paving operations . . . and profits? Write for complete information.

IOWA MANUFACTURING COMPANY, Cedar Rapids, Iowa, U.S.A.

"Service is simplified 100% over any other make paver"

That's the word from Skelly's master mechanic, Wayne Stauffer. He says, "The Cedarapids is so easy to maintain . . . to get inside, all I have to do is lift the deck plates and everything is right where I can get at it. The machine has fewer drive chains, another thing I like. It's a snap to grease because the fittings are easy to get at. This is always a headache with other machines. The automatic controls make operation so easy that I could train a man in one day and know he'll do a good job."



Here's the rest of your Cedarapids Bituminous Paving "Package"

There's a size and type of bituminous mixing plant in the Cedarapids line to meet your needs. The big G60 portable batch-type plant (left) or the H60 stack-up plant deliver up to 240 tons per hour to keep up with the high capacity of the Cedarapids Bituminous Paver. Sizes range down to the Model H15 (right) for producing specification mix in the volume you need.

Cold-weather concrete placement was common on this bridge job near Thompson Falls, Mont. The contractor, Peter Kiewit Sons' Co., placed 2,500 yards of concrete for piers, bents, and abutments, in temperatures as low as 10 degrees above zero. The Master B-400 portable heater (circled in the photo) was placed on a platform right up on the pier in order to furnish heat while the contractor placed concrete for the cantilever cross beam. The Master heater burns kerosene or No. 1 fuel oil and runs off regular 115-volt ac current. This particular model puts out 400,000 Btu per hour. For further information write to the **Master Vibrator Co.**, Dept. C&E, 1752 Stanley Ave., Dayton 1, Ohio, or use the Request Card at page 18. Circle No. 67.

New snowplow wax can be used outdoors

A new snowplow wax, which can b applied out of doors on cold plows, announced by Speco, Inc.

Known as Snow-Rem Super, th material employs fast-acting non freezing dryers in combination wit carnauba wax and silicone additives

According to the manufacturer, i can be either brushed on or sprayed Plows may be placed in service 2 minutes after Snow-Rem coating, and it is claimed that plow operators, by coating blades, moldboards, and wings, can increase their daily plow ing mileage as much as 30 per cent

For further information write to Speco, Inc., Dept. C&E, 7308 Associ ate Ave., Cleveland 9, Ohio, or use the Request Card at page 18. Circle No. 58.

Portable batching plant has 300-ton capacity

A 300-ton-capacity Fairbatch batching plant, offered in aggregate or combined aggregate and cement types, is announced by The Fairfield Engineering Co. Various arrangements from 2 to 8 compartments may be obtained.

Smaller Fairbatch plants are available down to 100 tons.

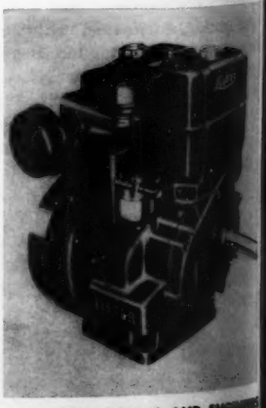
For further information write to the Standard Products Division, The Fairfield Engineering Co., Dept. C&E, 324 Barnhart St., Marion, Ohio, or use the Request Card at page 18. Circle No. 128.

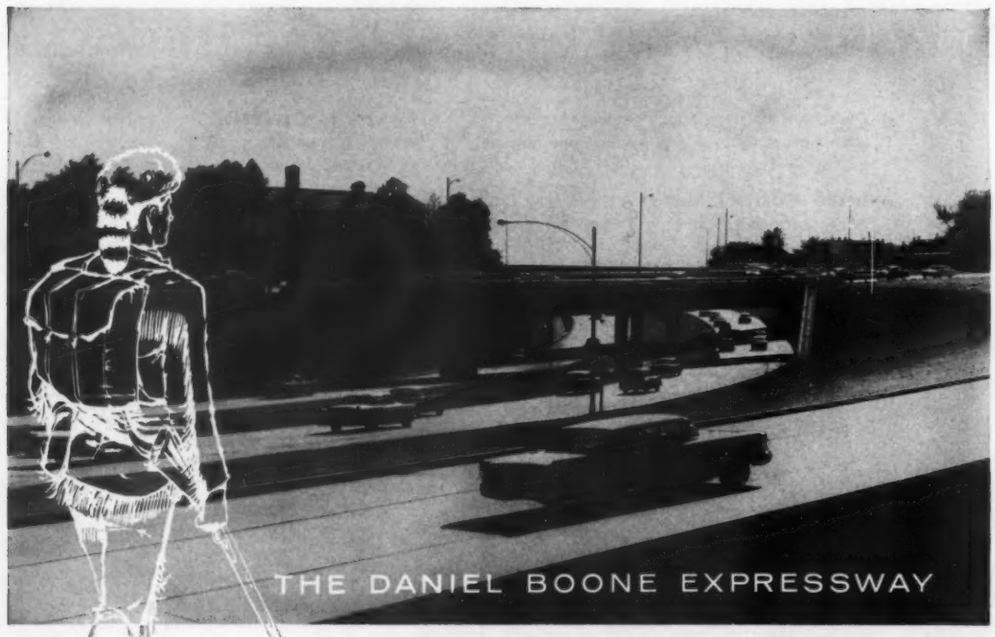
Easy cold-weather starts with air-cooled diesels

According to the manufacturer, the Lister air-cooled diesel engine is so designed that it will operate continuously under the most exacting conditions with a minimum of maintenance and, with the specially designed hand cranking facility and high compression, will start immediately in sub-zero temperatures. In addition, there is no danger of freezing and cracked heads.

The engines are available in a range from 3½ to 36 horsepower.

For further information write to Lister-Blackstone, Inc., Dept. C&E, 42–32 21st St., Long Island City 1, N. Y., or use the Request Card at page 18. Circle No. 13.





The section of the Daniel Boone Expressway shown above was built by Millstone Construction, Inc., St. Louis.

OLD DAN'L NEVER KNEW...

This newly completed concrete highway bearing the name of Daniel Boone speeds traffic through the very countryside old Dan'l once traveled and knew only as a tangled wilderness.

Modern construction genius employing Laclede's complete designed reinforcement service is helping create a multi-million dollar national system of expressways, of which the Daniel Boone is a part. To withstand the constant pounding of cars to and from ever-expanding suburbs, these new freeways must be built *strong*.

Much of the needed strength comes from Laclede designed reinforcing steels—multi-rib reinforcing bars, welded wire fabric, welded dowel spacers, center and recess joints, tie bars and accessories.

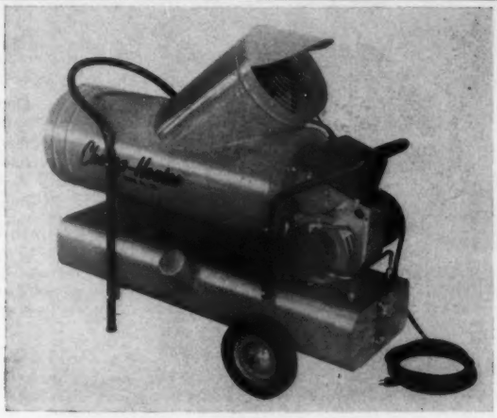
LACLEDE

LACLEDE STEEL COMPANY

SAINT LOUIS, MISSOURI ◆ Producers of Steel for Industry and Construction

For more facts, use Request Card at page 18 and circle No. 353

The Champ-Heater Model 120-T has, as standard equipment, a built-in thermostat that turns the unit off at a predetermined temperature.



Portable space heater has built-in thermostat

The new portable space heater offered by the Champion Heater Co. operates on the same principle that is used in residential-type oil burners. It has two entirely separate sources of air—one to support combustion, the second (on top of the heater) for heated-air circulation.

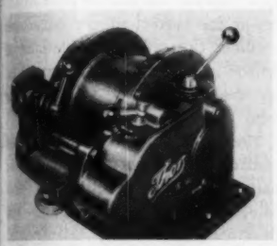
Designated Champ-Heater Model 120-T, the unit has a built-in thermostat as standard equipment. This thermostat, which turns the heater off at a predetermined temperature, also serves as a high-heat-limit safety switch that prevents the unit from overheating.

The Champ-Heater operates on regular 110 to 115-volt 60-cycle ac, and uses kerosene or No. 1 fuel oil.

For further information write to the Champion Heater Co., Dept. C&E, 3700 Forest Park, St. Louis 8, Mo., or use the Request Card at page 18. Circle No. 125.

Offer new tugger hoist with 7½-ton capacity

A new 1,500-pound-capacity air-operated tugger hoist with an exceptionally responsive dual control system is offered by the Thor Power Tool Co.



The Model 1500 is designed to lift, lower, and hold loads by air power, or permit free-wheeling lowering of unloaded rope. It is built for operation at floor level and has a wire-rope capacity of 280 feet.

The throttle control of the unit is mounted on the hoist, but it can be removed and operated from a remote position by means of connecting hoses. Safety features are "dead-man" power throttle, dynamic brake for controlling free wheeling, and mechanical load-holding lock.

For further information write to the Thor Power Tool Co., Dept. C&E, 175 N. State St., Aurora, Ill., or use the Request Card at page 18. Circle No. 27.

New dragline buckets for general-purpose use

The Williams Bucket Division of The Wellman Engineering Co. offers a new line of dragline buckets for light and general-purpose service.

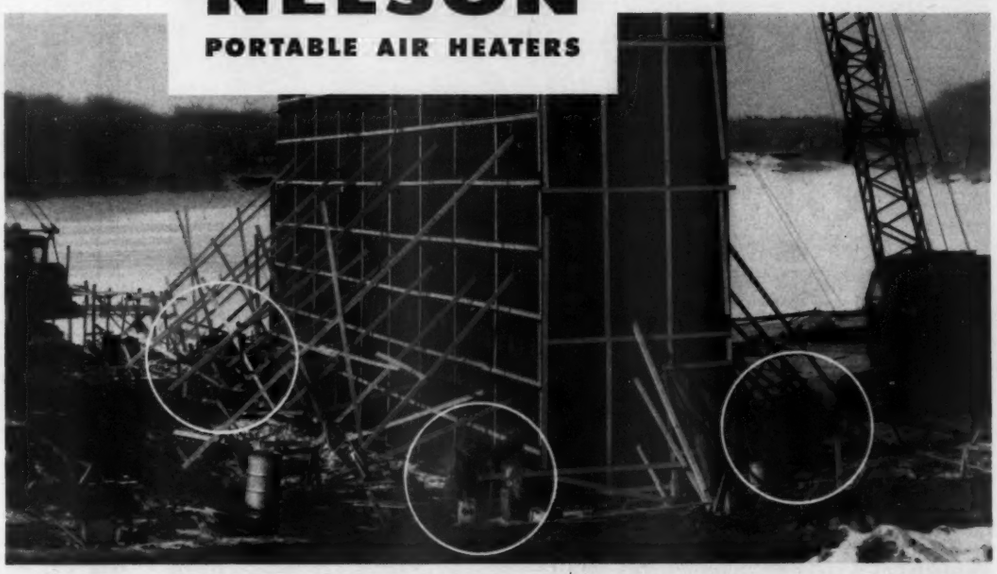
Known as Type DC, the units are available in sizes of ⅜ through 1 cubic yard, with or without perforations.

Lip, bottom scoop plate, and skid runners have been replaced by a heavy one-piece bottom, resulting in smooth interior and exterior surfaces of fast digging and instant dumping.

For further information write to the Williams Bucket Division, The Wellman Engineering Co., Dept. C&E, 112 St. Clair Ave. N. E., Cleveland 14, Ohio, or use the Request Card at page 18. Circle No. 43.

count on **HERMAN NELSON** *everybody else does!*

PORTABLE AIR HEATERS



NEW RED RIVER BRIDGE at Winnipeg, Manitoba, Canada. A fleet of Herman Nelson "Utility" heaters was used 24 hours a day, seven days a week, providing clean, safe, uncontaminated heat for curing the concrete abutments. Heaters were rented by the Simmons Construction Company to the Mike May Construction Company.

COLD IN NORTHERN CANADA! Herman Nelson heaters are used at far north bases of Okanagan Group, Canadian helicopter outfit. Heaters work steadily in temperatures of -20° to -40° F. to pre-heat engines.

SAFE, DEPENDABLE HEAT was assured with Herman Nelson "Thrifty" heaters for curing concrete in subfreezing weather on this Maryland Bridge. Contractor was Empire Construction Co., Baltimore.

FREE WEATHER FORECAST SERVICE
available on request, no obligation. Write today!

AMERICAN AIR FILTER COMPANY, INC.
Portable Products Department 52
Louisville 8, Kentucky

BUY OR RENT
Your safest investment is Herman Nelson Portable Heaters! For name of nearest dealer, contact your local AAF representative. Telephone listing in all major cities. Or write direct to Portable Products Dept., American Air Filter Co.

For more facts, use Request Card at page 18 and circle No. 354

Equipped with snowplow and wing, a LeTourneau-Westinghouse Model 660 grader works at clearing county roads a few miles south of Great Falls, Montana. The temperature at this time was between 5 and 10 degrees below zero. For further information write to the **LeTourneau-Westinghouse Co.**, Dept. C&E, 2301 N. E. Adams St., Peoria, Ill., or use the Request Card at page 18. Circle No. 72.

HIGHWAY'S
HEAVY-DUTY
"HC" DIGGER...
mounted on a
"BLUE OX"
HIGHWAY
UTILITY DIVISION
HIGHWAY TRAILER COMPANY
HEADQUARTERS: EDGERTON, WISCONSIN
Manufacturers of: Public Utility Bodies • Earth-Boring Machines • Pole and Cable Reel Trailers • Winches
Power Take-offs • Service Accessories • Commercial Trailers • Trailerized Tanks and Dry-Bulk Haulers
SALES AND SERVICE IN PRINCIPAL CITIES

For more facts, use Request Card at page 18 and circle No. 355

Big new hammermill added to Iowa line

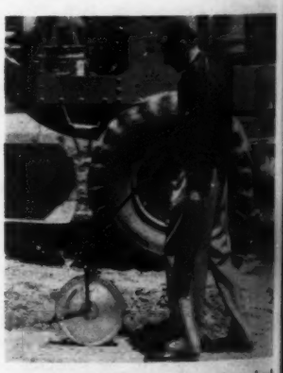
The Iowa Mfg. Co. announces the Cedarapids Model 5040 hammermill.

The new unit, the largest ever built by the company, features 40-inch hammer arc and 50-inch width-of-feed opening. The main frame is fabricated of heavy rolled-steel plate to give maximum strength; the breaker plate is reversible, one-piece manganese casting, adjustable so it can be set at the correct angle; replaceable hammer tips are adjustable outward on the spinner and can be turned for six wearing positions to take up for wear and hold gradation control.

Size of the finished product is easily controlled by moving the breaker plate closer to the hammers. This causes more impact breaking and finer products.

The Model 5040 is equipped with the standard three rows of hammers, and for special conditions where material is abrasive or when certain requirements in specifications must be met, this unit can be easily changed to a 2-row hammremill, with or without grates as desired.

For further information write to the Iowa Mfg. Co., Dept. C&E, 910 16th St. N. E., Cedar Rapids, Iowa, or use the Request Card at page 18. Circle No. 150.



A precision-calibrated measuring wheel that can be rolled over even the most irregular terrain is available from Rolatape, Inc. Designated Model 415, the wheel can be operated by one man, registering measurements to ½ inch on one side of the disk wheel and tenths of a foot on the other, up to 100,000 feet. Curves and contours are measured just as easily as straight, flat surfaces, according to the manufacturer. It can also be operated from a car window at low speeds. For further information write to **Rolatape, Inc.**, Dept. C&E, P. O. Box 1190, Santa Monica, Calif., or use the Request Card that is bound in at page 18. Circle No. 117.

Floating suction strainer keeps sand out of pumps

A floating suction strainer is offered by Megator Pumps & Compressors, Inc., for users of pumps that draw from streams, ponds, and sumps or are employed for dewatering mines, quarries, and excavations.

The Dolphin is designed to avoid drawing in either silt from the bottom or floating matter from the surface.

Called Dolphin, the unit is designed to draw the water from just below the surface to avoid drawing in either sand or silt from the bottom or floating matter from the surface. According to the manufacturer, the strainer also prevents the entrainment of air into the pump suction due to vortex formation.

The Dolphin strainer is light and compact and is readily fitted to the end of the suction hose. It is made in four sizes: for 1½, 2, 3, and 4-inch hoses.

The strainer is also said to be ideally suited to conditions where there is not sufficient depth of water for it to float.

For further information write to Megator Pumps & Compressors Inc., Dept. C&E, 930 Manchester Ave., Pittsburgh 12, Pa., or use the Request Card at page 18. Circle No. 3.

A battery of portable air heaters was kept in use around the clock while concrete was being placed at the huge Fremont Canyon Power Project, near Casper, Wyo. The Herman Nelson heaters helped maintain a temperature of about 50 degrees F for curing the concrete, both at Pathfinder Dam and at the hydroelectric plant being built in Fremont Canyon. The heaters also were used at the concrete batching plant (see photo), where heat was directed onto the shakers to prevent water lines from freezing. Coker, Kiewit, Cunningham of Casper are joint-venture contractors on the job. For further information write to the **American Air Filter Co.**, Dept. C&E, 217 Central Ave., Louisville 8, Ky., or use the card at page 18. Circle No. 83.

SOLO CONCRETE VIBRATOR

The only NEW DEVELOPMENT IN CONCRETE VIBRATORS IN 25 YEARS! 25,000 V.P.M.—"higher than hi-cycle"—this one man tool saves you $25 per day. It eliminates eccentric bearings and puts the $40.00 per 100 hours you normally pay for bearing replacement *right back in your pocket.*

Write for free demonstration. There's a PM Field Engineer near you.

Pacific Mercury
14032 Burbank Blvd.
Van Nuys 4, Calif.
13222 Lowdwell
N. Hollywood 4, Calif.
Manufacturers of the Thomas Electronic Organ

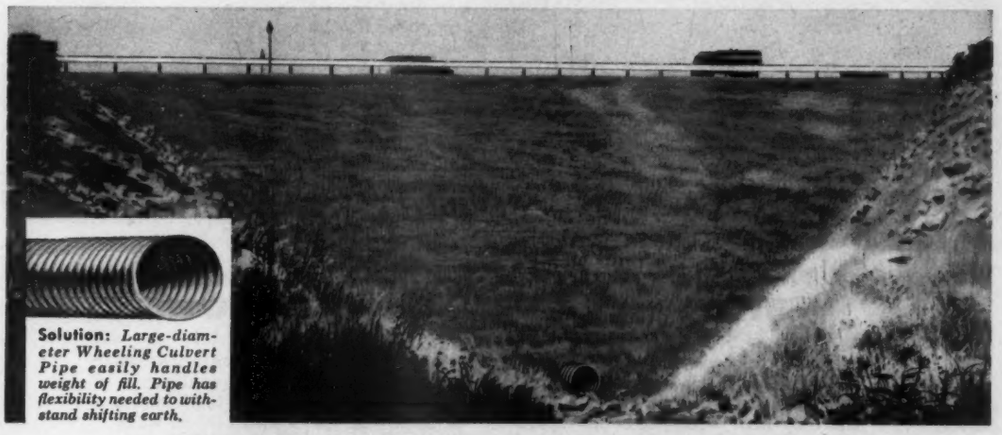
For more facts, circle No. 356

Wheeling

METAL CULVERT PIPE BY WHEELING

Problem: *How to drain this deep draw without using costly bridge. Difficulty is increased because of shifting earth.*

Have to drain deep, shifting fills?



Solution: *Large-diameter Wheeling Culvert Pipe easily handles weight of fill. Pipe has flexibility needed to withstand shifting earth.*

Use this flexible metal culvert pipe!

Wheeling Pipe Arch—a wide, comparatively flat-bottom type of corrugated metal pipe for use where headroom is limited.

Small-diameter Wheeling Metal Pipe—ideal for farm and home drainage requirements.

Although ordinary heavy, rigid pipe *looks* stronger, it often cracks and breaks under deep or shifting fill. *But not Wheeling Corrugated Metal Culvert Pipe!*

Flexible Wheeling Pipe adjusts to changing pressures. Amazingly strong because it uses the surrounding earth to help carry the load.

Wheeling Metal Culvert Pipe or Pipe Arch comes in copper-bearing steel or copper-bearing pure iron, plain galvanized or bituminous coated (with or without paved invert). Available in a wide range of gauges and diameters.

Ask your nearby Wheeling culvert plant, warehouse or sales office for full details. Wheeling Corrugating Company, Wheeling, West Virginia.

WHEELING CORRUGATING COMPANY · IT'S WHEELING STEEL!

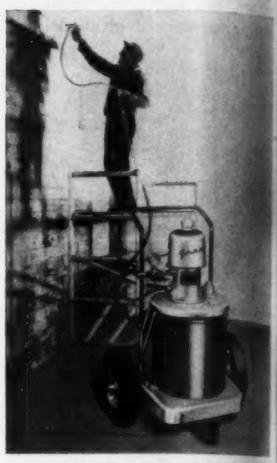
Immediate delivery on all stocked items from these warehouses: *Boston, Buffalo, Chicago, Columbus, Detroit, Kansas City, Louisville, Madison, Minneapolis, New Orleans, New York, Philadelphia, Richmond, St. Louis.* Sales Offices: *Atlanta, Houston*

For more facts, use Request Card at page 18 and circle No. 357

Working in frost 12 to 18 inches thick, this International Drott TD-15 Four-In-One uprooted and removed large trees on an apartment building project in Dolton, Ill. The machine, owned and operated by Raymond Lotz, of Riverdale, Ill., was also used to backfill around the foundations of the buildings. For further information write to the **International Harvester Co.,** Dept. C&E, 180 N. Michigan Ave., Chicago, Ill., or use the Request Card at page 18. Circle No. 55.

Paint-spraying process eliminates atomizing air

A new paint-spraying process that eliminates the need for atomizing air, heat, or excessive solvents is announced by the Gray Co., Inc.

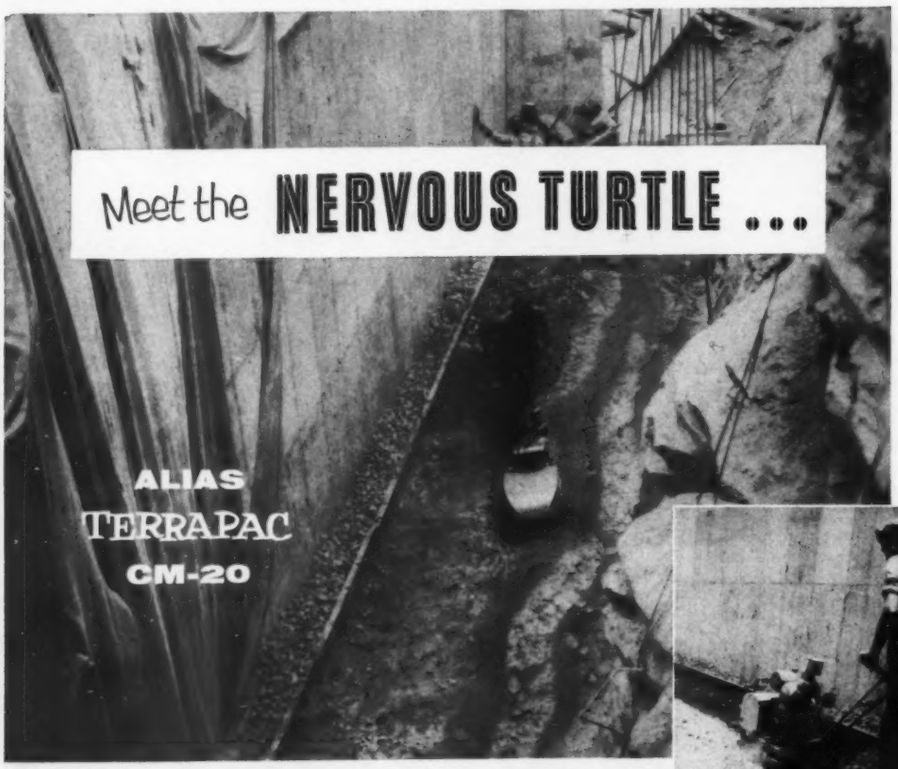


Air-powered, the Hydra-Spray pump exerts no pressure in the container and eliminates electrical connections.

Called Hydra-Spray, the unit utilizes a combination of high fluid pressure and a small fluid nozzle to create fine material breakup without atomizing air, thus reducing overspray, bounce-back, and hazardous fumes to a minimum.

Because this unit uses a specially designed air-powered pump that produces fluid pressure 20 times that of the inbound air pressure, no heat or excessive solvent is required to reduce paint viscosity to a sprayable consistency, states the manufacturer.

For further information write to the Gray Co., Inc., Dept. C&E, 1011 Sibley St. N. E., Minneapolis 13, Minn., or use the Request Card at page 18. Circle No. 5.



Work in the most confined areas at less cost than old-fashioned tamping methods.

the Latest Development in

VIBRATORY SOIL COMPACTORS

Down South they wouldn't know what a CM-20 is, but ask about the Nervous Turtle and you get an earful . . . It's the only heavy-duty, one-man operated compactor on the market - develops a 6,600 lb. compaction wallop at speeds up to 75 feet a minute . . . Handles not only granular materials but many clay mixtures as well . . . Maneuvers close to abutments, retaining walls and piling; ideal for backfill jobs and shoulder work, railroad embankments, floors and foundations . . . The CM-20 penetrates up to 30 inches or more - in one or two passes, while its smaller version, the CM-15, will compact lifts up to 12 inches . . . Ask your local Terrapac distributor to demonstrate the model that is best suited to meet all of your varied job requirements. Call him today - you'll be ahead. 41-78

NO COMPARABLE MACHINES ON THE MARKET TODAY!

VIBRO-PLUS PRODUCTS, Inc.
STANHOPE, NEW JERSEY

WORLD'S LEADING MANUFACTURER OF VIBRATORY EQUIPMENT FOR OVER TWO DECADES.

For more facts, use Request Card at page 18 and circle No. 358

HUSCO HYDRAULIC CYLINDERS

Basic Designs Adapted to Cost-Saving Custom-Engineering

You'll solve your special Hydraulic Cylinder needs faster, at lower cost, by a quick call to HUSCO—and a custom-engineered modification of one of many HUSCO Basic Cylinder Designs . . . Telescoping, Single-Acting, Double-Acting Differential Types in many sizes, offer features that assure improved performance, longer service, lower initial and operating cost, on your equipment. Write for details —or the answer to one of your problems. Check HUSCO *first* for modern hydraulic units engineered to your specific needs. Write or phone . . .

HUSCO HYDRAULIC UNIT SPECIALTIES CO.
Pumps • Valves • Cylinders
P.O. Box 257-E, Waukesha, Wis.

For more facts, circle No. 359

When a mountainous pile of unsalable torpedo gravel threatened to engulf plant property, Winter Bros. Material Co., of Fenton, Mo., producers of sand and gravel in the St. Louis area, came up with a solution that not only relieved the space problem but reportedly turned the big liability into a tidy profit. This was accomplished by the installation of a Symons 54-inch Gyradisc crusher that converted the ⅜-inch torpedo gravel into salable, manufactured sand. In addition, it was discovered that another premium product, a filter medium, was produced through one of the two Symons V-screens installed to dewater the torpedo gravel before crushing. For further information write to the **Nordberg Mfg. Co.**, Dept. C&E, 3073 S. Chase Ave., Milwaukee, Wis., or use the Request Card that is bound in at page 18. Circle No. 89.

To obtain further information on any of the products described in this section, circle the number given at the end of the item on the Request Card at page 18.

Portable meter measures moisture content of soil

Exact moisture content of sand, soil, or any bulk material is measured instantly and automatically by a new portable electronic moisture meter. Moisture content registers on the dial when the probe, connected by insulated cord to the meter, is plunged into the material.

For further information write to the C & W Sales Co., Dept. C&E, 1490 Franks Lane, Menlo Park, Calif., or use the Request Card at page 18. Circle No. 141.

Offer chamfer strip for concrete forming

The Universal Form Clamp Co. offers an innovation in chamfer strip for use on all types of concrete forming.

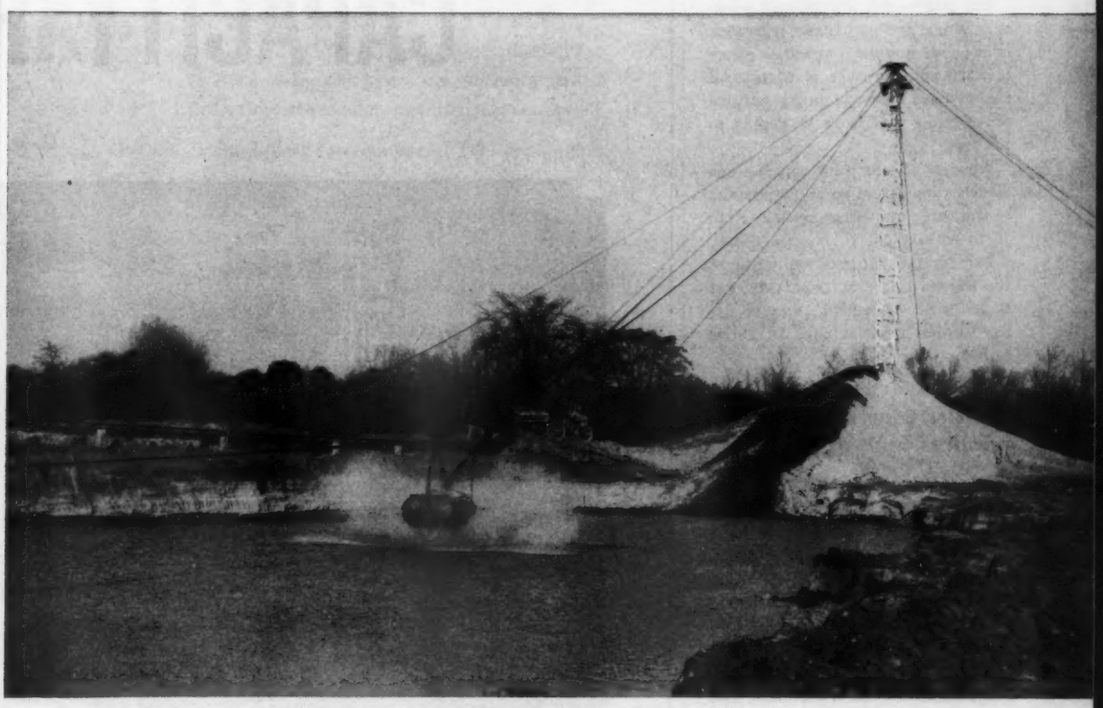
According to the manufacturer, this chamfer strip has a special rubber extrusion of the proper consistency and stiffness to provide complete flexibility and re-usability.

For further information write to the Universal Form Clamp Co., Dept. C&E, 1238 N. Kostner Ave., Chicago 51, Ill., or use the Request Card that is bound in at page 18 of this issue. Circle No. 41.

Cold-weather starting problems have been solved through use of an Onan dc electric plant, according to the Al Johnson Construction Co., Minneapolis. Mounted on a dolly with a heavy-duty Gould battery booster, this 125-pound Onan plant pours a steady stream of 12-volt current into the booster battery as the crews make their rounds, starting the big engines. For further information write to **D. W. Onan & Sons Inc.**, Dept. C&E, 2515 University Ave. S. E., Minneapolis 14, Minn., or use the Request Card at page 18. Circle No. 4.

USS Tiger Brand — America's No.1 Wire Rope used for more than 50 years

ON SAUERMAN SLACKLINE CABLEWAY EXCAVATORS



Low-cost method of digging sand and gravel with a cableway using USS Tiger Brand Wire Rope. Only one operator is needed.

This year Sauerman Bros., Inc. celebrates their fiftieth year of building slackline cableway excavators. Back in the beginning, engineers at American Steel & Wire designed and built a special wire rope for them known as the "Sauerman Special Excavator Rope."

This is a USS Tiger Brand Rope of superior quality that combines strength, flexibility and ability to resist abrasion, all essential in cableway operation. The rope has proved highly satisfactory, and Sauerman has used it exclusively during the past 50 years. This application shows why a rope that is *engineered for the job* will last longer and reduce your wire rope costs.

Sauerman Bros., Inc. carries a complete line of Tiger Brand Wire Rope for Slackline Cableway Excavators. For further information on USS Tiger Brand, write American Steel & Wire, Dept. 9204, 614 Superior Avenue, N.W., Cleveland 13, Ohio.

USS and Tiger Brand are registered trademarks

Why Tiger Brand is your best buy

1. It is made by a company that maintains the most complete research and manufacturing facilities in the steel industry.
2. It is designed by one of the country's most capable staffs of wire rope engineers. It is serviced by thoroughly experienced field representatives always ready with their assistance.
3. Every type of Tiger Brand Wire Rope is designed for specific applications. You get the right rope for the job.
4. It is made by one company, U. S. Steel, and every step of production, from ore to finished product, is carefully controlled and supervised to guarantee one high standard of quality.
5. Tiger Brand Wire Rope is manufactured by the foremost single wire rope producer in the country.

American Steel & Wire Division of United States Steel

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
Tennessee Coal and Iron Division, Fairfield, Ala., Southern Distributors
United States Steel Export Company, Distributors Abroad

For more facts, use Request Card at page 18 and circle No. 360

In the reconstruction of the Interstate Bridge between Portland, Ore., and Vancouver, Wash., five concrete piers are being heightened as much as 38 feet, requiring enlargement of their bases with new concrete. To tie the new concrete to the old, 45 holes—14 feet long and 4 inches in diameter—were core-drilled to allow insertion of heavy steel rods. These tensioned rods, projecting 6 feet from each end of the holes, assure proper adherence of the new concrete to the existing bases. The special bit and core barrel necessary for this job were designed and manufactured by the Christensen Diamond Products Co., under the supervision of T. R. Harris, general superintendent, General Construction Co., of Portland. This unique equipment was specifically designed to operate economically in a confined space 40 feet below the river surface. For further information write to the **Christensen Diamond Products Co.**, Dept. C&E, P. O. Box 387, Salt Lake City 10, Utah, or use the Request Card at page 18. Circle No. 52.

New utility-pump line available in 7 sizes

A new line of general-purpose portable utility pumps meeting high head requirements and featuring new Sabre-Jet design and construction features is announced by the Barnes Mfg. Co.

The pumps are available in seven sizes, single and multistage, with four horsepower options. Capacities range to 2,520 gph, pressure to 60 psi. All models have quad volute for positive self-priming and work at depths to 139 feet.

Weights of the four single-stage models range from 65 to 87 pounds; of the three multistage models, from 76 to 90 pounds.

For further information write to the Barnes Mfg. Co., Dept. C&E, 651 N. Main St., Mansfield, Ohio, or use the Request Card at page 18. Circle No. 93.

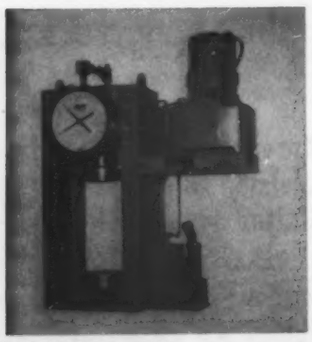
Job-site concrete tester features built-in pump

The new Forney Model FT-20-E for job-site concrete testing features a special constant-flow electric pump permanently mounted so that the former method of attaching an electric pump by means of a length of hose is completely eliminated.

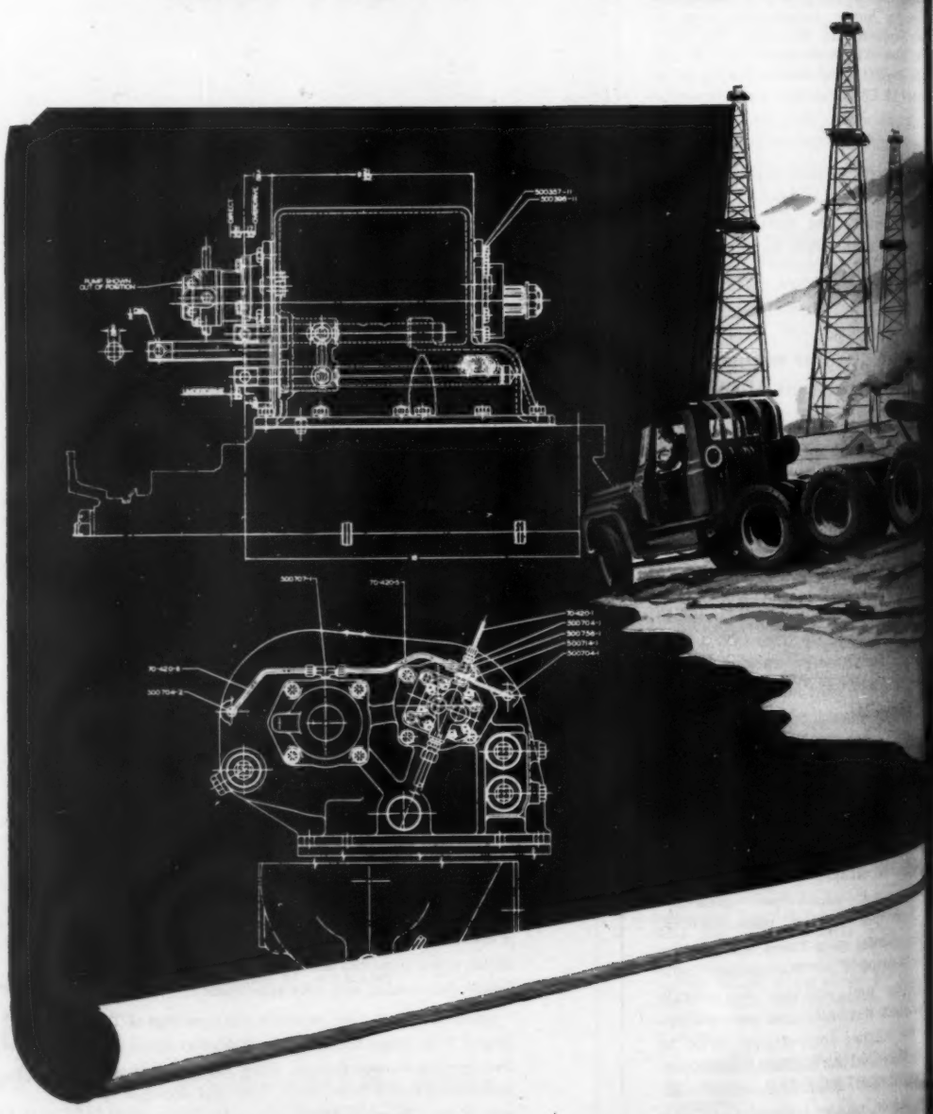
The unit weighs 540 pounds equipped with both manual and electric pumps, and has a maximum load rating of 250,000 pounds.

A full range of accessories is available.

For further information write to Forney's Inc., Tester Division, Dept. C&E, P.O. Box 310, New Castle, Pa., or use the Request Card at page 18. Circle No. 36.



NEW SPICER PTO HA
CAPACITY FOR HEA



On the Cummer plant, all foundations are at grade level; concrete piers or pits are not needed.

Batch-type asphalt plant produces up to 210 tph

A high-capacity batch-type asphalt plant, the Model C series, is available from The F. D. Cummer & Son Co.

Designed for maximum portability, this plant features individual trunnion roll drives on the dryer to eliminate chain and bull gears, small high-alloy mixer liners for easy replacement, oversize shafts and bearings throughout, an asphalt pressure injection system said to spray a full batch in only two seconds, and a quick-erecting stack-up-type tower.

All foundations are at grade level, eliminating the need for concrete piers or pits.

This series is available in 4,000, 5,000, and 6,000-pound batch capacities with outputs of 120 to 210 tph.

For further information write to The F. D. Cummer & Son Co., Dept. C&E, 2110 E. 21st St., Cleveland, Ohio, or use the Request Card at page 18. Circle No. 123.

HEATER
EAVY DUTY WORK

● Rugged, round-the-clock service, where full engine torque is a "must", calls for a top-mounted PTO with the capacity to transmit that torque constantly and smoothly. Whether the vehicle is an oil field rig, a cement mixer truck, or a sand and gravel dump, the job can be done at highest operating efficiency with a Spicer forced-feed, top-mounted power take-off.

The Spicer top-mounted PTO—with either a Spicer 8031 or 8341 auxiliary transmission—outlasts conventional PTO's because positive lubrication is assured at all times, regardless of the operating angle of the vehicle. An oil pump provides forced-feed lubrication at slow speeds with full engine torque.

Spicer top-mounted power take-offs transmit the full torque of the engine with forward transmission in direct drive, or loads equivalent to engine torque with forward transmission in gear, to operate air compressors, heavy duty winches, large pumps and other equipment. Two speeds forward, one speed reverse.

Where definite torque rating of the Spicer PTO is desired, Dana engineers will gladly submit this information upon receipt of complete data on the installation and type of operation.

For further information write Dana Corporation, Toledo 1, Ohio.

DANA Spicer

DANA CORPORATION

Toledo 1, Ohio

...ing Transportation—Transmissions • Auxiliaries • Universal Joints • Clutches • Propeller Shafts • Power Take-Offs
...rque Converters • Axles • Powr-Lok Differentials • Gear Boxes • Forgings • Stampings • Frames • Railway Drives

Many of these products are manufactured in Canada by Hayes Steel Products Limited, Merritton, Canada

For more facts, use Request Card at page 18 and circle No. 361

New line of snowplow wearing parts and blades

A new line of roll-forged snowplow wearing parts and blades is announced by Bucyrus Blades, Inc.

According to the manufacturer, this new ForgeTemp line has been designed with uniformly high resistance to impact and abrasion wear throughout the cross section of the wearing part or blade.

Included in the line are shoes, nose pieces, wear plates, adapter brackets, plow and wing blades for every make and model of snowplow equipment.

For further information write to Bucyrus Blades, Inc., Dept. C&E, Bucyrus, Ohio, or use the Request Card at page 18. Circle No. 40.

Track adjustment eased on crawler tractors

Increased ease of track adjustment on three Caterpillar-built crawlers has been announced, with the introduction of hydraulic track adjusters as attachments for the D4 and D6 tractors and for No. 977 Traxcavators.

The new adjusters allow track tension to be adjusted with a standard hand-operated grease gun and replace the former bolt-and-wrench system. The manufacturer claims prolonged track life as a benefit, since the new easier method encourages operators to correct track tension at proper intervals.

For further information write to the Caterpillar Tractor Co., Dept. C&E, Peoria, Ill., or use the Request Card at page 18. Circle No. 76.

Offer conversion unit for obsolete flashers

Pacific Mercury has available a new conversion unit to convert obsolete flasher warning lights into modern, usable units that meet national and local safety standards.

The Model WC-5 is a complete transistorized incandescent flasher circuit encapsulated in a small plastic container.

For further information write to Pacific Mercury, Dept. C&E, 14052 Burbank Blvd., Van Nuys, Calif., or use the Request Card at page 18. Circle No. 95.

Auger attaches to mower, cleans clogged culverts

Clogged culverts and drainage tubes can be opened speedily with the new hydraulic earth auger offered by Topeka Hiway Mower, Inc.

The horizontal auger and the drive box attach to the side of the company's Forty Mile mower. The entire assembly can be mounted or dismounted in 10 minutes, according to the manufacturer. The auger uses the same hydraulic system as the mower.

The culvert cleaning attachment consists of the drive box, a 20-foot drive tube, and a 10-foot tube extension, plus two 10-foot augers, one 6 inches and one 9 inches in diameter. In addition to the boring action, there is a certain amount of "whip" to the augers, making it possible to clean tubes larger in diameter than the augers.

Mounted on the Topeka mower, the auger can be driven to and from job sites at regular traffic speeds. The auger can be operated from the front or rear of the drive box. By augering from both ends, culverts up to 60 feet in length can be cleared.

For further information write to Topeka Hiway Mower, Inc., Dept. C&E, 623 E. Seventh St., Topeka, Kans., or use the Request Card at page 18. Circle No. 22.

The operator can switch from auger to mowing operations in a couple of minutes. The auger uses the same hydraulic system.

THE '59 LINE OF Kelley

CONTRACTORS' EQUIPMENT

- UP-TO-DATE DESIGNS
- CAREFULLY ENGINEERED AND FULLY TESTED
- BUILT FOR ROUGH USE
- SPEEDS UP WORK... SAVES MONEY

POWER TAMPERS

Self-propelled . . . delivering 2400 impacts a minute. Two models: 18" wide shoe, and 36" wide shoe. For packing down earth backfill to maximum density next to foundations, on road-widening jobs, etc. Also for finishing blacktop . . . with heater shoe attachment available.

POWER TROWELS

Six models to choose from . . . 2 de-luxe Hydra-Trowels, 34" and 44" sizes, with fingertip blade control . . . and 4 super models with manually-adjusted blade pitch: 24" Kelley Bantam, 29" Kelley Boy, the popular 34" Kelley Chief and the big 44" Kelley Commander . . . a size for every job.

POWER BUGGIES

Positively tops for fast and dependable handling of concrete and other materials. Hydraulic mechanism dumps or spreads loads up to 10 cu. ft. and there's full power in *both* front wheels for extra traction. Safety step and guards protect operator.

SPACE HEATERS

What a blast! From the Kelley Hot Shot Space Heaters, one delivering 120,000 Btu/Hr and the other delivering 320,000 Btu/Hr. Let 'er blow outside . . . work goes on inside with Kelley Hot Shots! For work around walls, floors, scaffolds and hundreds of other construction jobs.

COMPACTORS

The new Kelley Compactor with "Compaction Control" . . . easier operating, faster, more powerful. For compaction-floating all types of concrete floors, for keying in surface hardeners, and for bonding dry-tamp floor topping to a concrete slab. Grinding attachments available.

Kelley MACHINE DIVISION
The Wissner-Ropp Co., Inc.
285 Hinman Avenue
Buffalo 23, N. Y.

Please send us information on Kelley products

NAME _____

STREET _____

CITY _____ ZONE _____ STATE _____

For more facts, use coupon or Request Card at page 18 and circle No. 362

Push-type hose fitting is easy to assemble

A new line of easy-to-assemble fittings and industrial hose for air, water, oil, and fuel service at pressures under 250 psi is announced by the Parker Fittings and Hose Division of the Parker-Hannifin Corp.

The fitting, called Push-lok, will not pull out of the hose, according to the manufacturer. The hose is pushed on over barbs on the stem of the fittings; it is expanded over the barbs, causing it to contract within the depressions and thus grip the stem firmly.

Two types of hose are available for use with the Push-lok fittings. No. 821 hose has fiber-braid reinforcement and cotton-braid cover. No. 831 hose has fiber-braid reinforcement and abrasion-resistant rubber cover. Five sizes are offered from ¼-inch through ¾-inch inside diameter. Temperature range is from minus 65 degrees F to plus 250 degrees, except for air which is 160 degrees maximum. Fittings with seven different connecting ends are offered.

For further information write to the Parker-Hannifin Corp., Parker Fittings and Hose Division, Dept. C&E, 17325 Euclid Ave., Cleveland 12, Ohio, or use the Request Card at page 18. Circle No. 136.

Permanent steel form for floor, roof slabs

Fab-Form, a corrugated, permanent steel form for concrete floor and roof slabs, is announced by Pittsburgh Steel Products, a division of the Pittsburgh Steel Co.

Fab-Form sheets, designed for slabs over beams or joists, are available in lengths up to 28 feet 3 inches. Cover width is 32 inches.

Fabricated from 27-gage cold-rolled, high-tensile-strength steel, Fab-Form has ⅝-inch-deep corrugations. It is available uncoated or coated with a baked-on iron-oxide primer.

For further information write to the Pittsburgh Steel Products Division, Pittsburgh Steel Co., Dept. C&E, Grant Bldg., Pittsburgh 30, Pa., or use the Request Card at page 18. Circle No. 127.

save your voice

with the Falcon Chief and save money, too!

speak as you normally would—be clearly heard and understood up to ½-mile away!

Unique transistorized power megaphone—an instrument you will be proud to own. Gives up to 6,000 two-second amplified messages from standard replaceable battery. Light (3¼ lbs.)—easy to handle and use. Attractive red and gray polyethylene—built for abuse. Attractively priced for you, too!

WRITE for particulars — and free, informative "Sounds for Safety" folder! Dept. CE

Falcon® ALARM CO., INC.
SUMMIT, NEW JERSEY

For more facts, circle No. 363

IF IT'S A WET JOB

let Griffin analyze your ground water problem and estimate costs

GRIFFIN WELLPOINT CORP.

SALES • RENTAL • CONTRACT

881 E. 141st St., New York 54, N. Y.
Jacksonville, Fla. • Houston, Tex.
W. Palm Bch., Fla. • Hamden, Conn.

For more facts, circle No. 364

Curing, sealing agent for new concrete floors

A combination curing agent and seal for new concrete floors is announced by The Tremco Mfg. Co.

In one application, Tremcrete provides a high degree of water retention in the concrete while the proper cure takes place. It is also said to exhibit exceptional abrasion resistance, resisting dusting, solvents, and alkalies.

Tremcrete may be applied to new concrete floors 10 to 12 hours after final troweling; it dries to tack-free stage in two to three hours.

For further information write to The Tremco Mfg. Co., Dept. C&E, 10701 Shaker Blvd., Cleveland 4, Ohio, or use the Request Card at page 18. Circle No. 28.

New pavement cutter attaches to graders

A pavement cutter that can be quickly attached to any medium or heavy-duty motor grader equipped with a scarifier beam is available from the Cutaline Co.

Called Cutaline Model 200, the unit produces a smooth, vertical cut in asphaltic pavement, up to 4 inches in depth.

According to the manufacturer, the special-alloy, heat-treated blade has a long work life.

For further informaton write to the Cutaline Co., Dept. C&E, 425 N. Laurel Ave., Ontario, Calif., or use the Request Card at page 18. Circle No. 20.

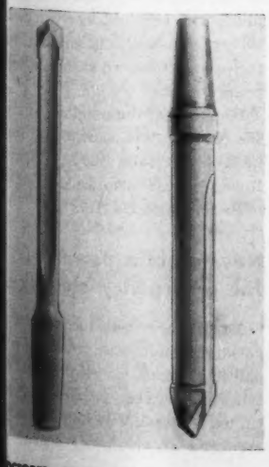
Carbide hammer bits and masonry drills

New carbide-tipped hammer bits and masonry drills are available from the Modern Mfg. Co., Inc.

Called Rocket Thrust, the bits reportedly can drill up to 500 linear inches without resharpening.

Carbide-tipped drills are made for reciprocating hammers and rotary drills, and are available in sizes from 7/16-inch up to 1-inch diameter.

For further information write to the Modern Mfg. Co., Inc., Dept. C&E, 000 Davisville Road, Willow Grove, Pa., or use the Request Card at page 18. Circle No. 116.



Suited for towing rubber-tire compaction rollers in the 13 to 20-ton class, the Napco-Crab tractor combines the advantages of 4-wheel-drive traction with the benefits of a torque converter. According to the manufacturer, it is able to turn in only half the area normally required by conventional tractors. Counterweights provide maximum drawbar pull and are available for either front or rear mounting. These counterweights are of the adjustable box type and include provisions for a built-in clevis or pintle hook suitable for use with standard roller towbars. For further information write to the Construction Equipment Division, **Napco Industries, Inc.**, Dept. C&E, 834 N. Seventh St., Minneapolis 11, Minn., or use the Request Card at page 18. Circle No. 104.

NEW 60-TON LORAIN MC-760 MOTO-CRANE with 8 x 4 carrier "Power-Set" Outriggers

BIG PERFORMANCE ON THE JOB

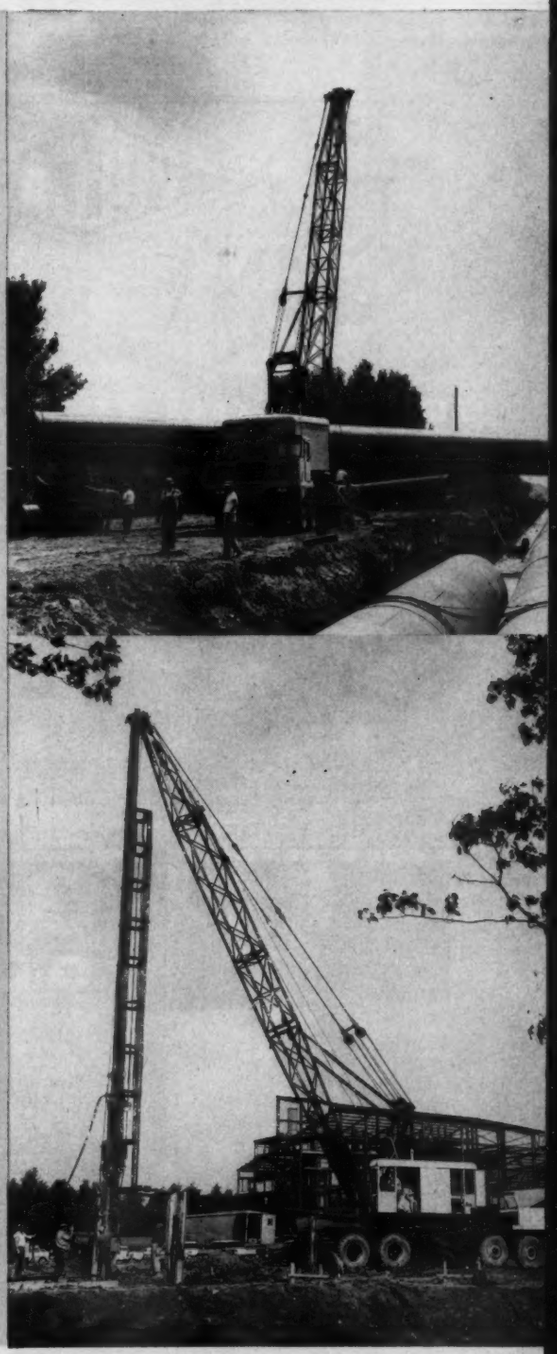
- **Lorain Power-Set Outriggers** set up in less than 60 seconds, automatically adjust to uneven terrain, permit 40-second move-ups.
- **"Shear-Ball" turntable connection** eliminates all maintenance and adjustment. Only routine lubrication needed. Warranted for 10 years.
- **A 40′ basic boom** extends to 170′ with center sections. Square-tubular-chord design, new alloy steel . . . lighter, longer, stronger.
- **Front bogie** is Lorain-designed with solid equalizer beams to provide big "on-rubber" capacities.
- **Folding gantry, power operated,** lowers to carry boom in travel position without exceeding overall cab height.
- **Boom is raised and lowered** by positive and independent clutch control for extreme precision.
- **With a 230″ wheelbase,** an overall width of 135″, the MC-760 has a heavy, welded box-section chassis frame . . . no weave, no deflection under the heaviest loads.

FAST TRAVEL BETWEEN JOBS

- **Forward speeds** from 1.2 to over 37 mph. Air brakes on all 8 wheels.
- **17,000-pound rear counterweight** is easily removed with timesaving, hydraulic jacks to reduce road weight.
- **Removable outrigger boxes** and beams have fast-action, pin connections and hydraulic disconnects.
- **Hydraulic assist,** patented, centralized steering provides effortless driving, best front wheel tracking.
- **Low overall height.** A 14′ span between second and third axles meets most stringent bridge formulae.
- **Tandem drive rear axles.** Final reduction through planetary wheel hubs to relieve power train of strains.

For further details see your Lorain distributor.

THE THEW SHOVEL COMPANY, LORAIN, OHIO



LORAIN®

ON THE MOVE

PLANTS in Lorain, Elyria and Bucyrus, Ohio.

PRODUCTS—Power shovels, cranes, draglines, clamshells, and hoes on crawler mountings from ⅜- to 2½-yard capacity • Cranes from 7 to 80 tons . . . on crawlers, and as rubber-tire Moto-Cranes, and Self-Propelled Cranes • Rubber tire front-end Moto-Loaders in 1¾- and 2-yard models.

OUTLETS—Lorain products sold and serviced by 249 distributor outlets throughout the world.

For more facts, use Request Card at page 18 and circle No. 365

A small, highly portable batching plant, operating up to 24 hours a day, is supplying 30,000 cubic yards of concrete for construction of the 8-mile-long hydro-pressure tunnel of the Mammoth Pool hydro-electric project near Fresno, Calif. The Utah Construction Co. is the general contractor. The plant, a Noble Batch-a-bout, discharges materials to 6-cubic-yard mixers operating on rails. The 1,000-cubic-foot cement silo is charged by a 350-barrel-per-hour vertical screw. Cement is batched automatically; weights are set from the control station on the aggregate batcher. The aggregate weigh batcher is charged by a front-end loader. For further information about the Batch-a-bout, write to the **Noble Co.**, Dept. C&E, 1860 Seventh St., Oakland, Calif., or use the Request Card at page 18. Circle No. 101.

Tool installs wellpoints in troublesome soils

The Griffin Wellpoint Corp. announces a new "sliding-weight" hole puncher said to successfully install wellpoints in hard-to-penetrate soils where it has proved difficult or impossible either to jet the wellpoints into the ground or to install them with standard-type hole punchers.

By means of a crane-controlled cable, the hole puncher is positioned upright, with its cutting head resting on the ground, and thereafter driven or allowed to sink a foot or so below grade. Jetting water is then pumped through the shank. The hole puncher is driven into the ground by alternately raising the sliding weight (which is controlled by the crane operator) and letting it fall on the striking plate.

The Griffin "sliding-weight" hole puncher is designed to install wellpoints in hard-to-penetrate soils where jetting methods or standard-type hole punchers have failed.

The weight of the hole puncher itself, which ranges from 1½ to 2 tons, plus the impact of the sliding weight, which weighs an additional ton—combined with the force and sluicing action of the jetting water issuing from the cutting head—pulverize and erode the troublesome soil, enabling the hole puncher to penetrate to the desired depth.

A rotating plug is then turned to the full-open position and a wellpoint inserted. Coarse sand is poured around the wellpoint until the annular space between the inner wall of the shank and the wellpoint is filled. The hole puncher is removed, leaving the wellpoint in place, and the process repeated at the next wellpoint location.

For further information write to the Griffin Wellpoint Corp., Dept. C&E, 881 E. 141st St., New York 54, N. Y., or use the Request Card at page 18. Circle No. 113.

New mobile power units for emergency standby

A new line of versatile mobile power-supply units with generators that deliver 3-phase or single-phase alternating current is offered by the United States Motors Corp. The units are used as emergency standby

VULCAN Super Service
PAVEMENT BREAKING TOOLS
QUALITY TOOLS GIVING BETTER SERVICE AT LESS COST WITH THESE ADVANTAGES:

Exceptional Durability — fully heat treated for maximum strength and freedom from premature breakage.

Unusual Strength — making use of the full power of modern hammers.

Unexcelled Performance — longer wearing, requiring less frequent resharpening.

Time-Tested — for over 25 years.

Liberally Guaranteed.

Specify **VULCAN** *for:*

PAVEMENT BREAKING TOOLS
CLAY DIGGING TOOLS
DRILL STEELS
PNEUMATIC HAMMER TOOLS
ELECTRIC HAMMER TOOLS
HAND TOOLS FOR CONCRETE, STONE, AND STEEL WORKERS

VULCAN

VULCAN TOOL MANUFACTURING COMPANY
41 LIBERTY STREET, QUINCY 69, MASSACHUSETTS
Specialists in the Design and Production of Pneumatic Tool Accessories

VULCAN TOOLS are sold by distributors throughout the United States and Canada.

For more facts, use Request Card at page 18 and circle No. 369

INGRAM ROLLERS

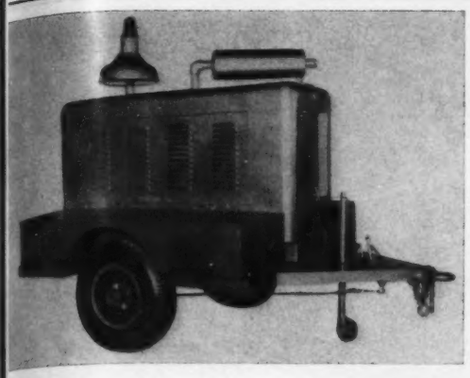
OVER 30 YEARS ENGINEERING EXPERIENCE brings you a ROLLER geared for...
- PERFORMANCE
- ECONOMY
- SIMPLICITY
- EASY MAINTENANCE

FEATURING... REVERS-O-MATIC DRIVE

Acme IRON WORKS
CULEBRA AVE. AT EXPRESSWAY N. W.
P.O. BOX 2030 • SAN ANTONIO 6, TEXAS

INGRAM ROLLERS ARE AVAILABLE IN ALL SIZES TANDEM AND 3 WHEEL

For more facts, use Request Card at page 18 and circle No. 370



normal power sources.

Called Versa-Trailer, the engine generator package is available in three sizes: 15, 25, and 35-kw, 3-phase. Each has a corresponding single-phase rating.

Three-phase voltages are 240, 3-wire, and 120/208, 4-wire. Single-phase voltages are 120 or 240-volt, 2-wire, and 120/240-volt, 3-wire.

Power is supplied by a liquid-cooled 1,800-rpm gasoline engine.

All equipment is mounted on a flat-bed 2-wheel trailer.

For further information write to the United States Motors Corp., Dept. C&E, 263 Nebraska St., Oshkosh, Wis., or use the Request Card at page 18. Circle No. 44.

Safeguard device offered for masonry core drilling

A new safeguard for diamond masonry core drilling, called No-Flo-No-Go, is announced by Diamond Products, Inc. Until water flows across the face of the bit, the drilling-rig motor won't start; and if the water stops, the rig motor stops automatically.

This device is standard equipment on two models of the firm's Core-Bore Drillmaster rigs. It is also available as an accessory, but must be factory-installed.

For further information write to Diamond Products, Inc., Dept. C&E, 323 Prospect St., Elyria, Ohio, or use the Request Card at page 18. Circle No. 85.

Crane for maintenance positions difficult loads

The Model WC54A hand crane for safe positioning of loads up to 300 pounds is offered by the Thern Machine Co.

The crane is powered by a small hand winch with a mechanical ratio of 30:1; thus for a capacity load the operator needs only 10 pounds of force to operate the lever handle.

Telescoping masts give a total lifting height of 9 feet 6 inches. Side bars on the mast enable smooth transport and turning of the entire crane.

For further information write to the Thern Machine Co., Dept. C&E, 3700 W. Fourth St., Winona, Minn., or use the Request Card that is bound in at page 18 of this issue. Circle No. 169.

For more facts, circle No. 371→

Boom pendant fitting for wire rope

Sherman & Reilly, Inc., has available a new boom pendant fitting for wire rope.

The fitting is made of steel, drop-forged in one piece. It is interchangeable with standard wire-rope sockets, the manufacturer states.

For further information write to Sherman & Reilly, Inc., Dept. C&E, First and Broad Sts., Chattanooga 2, Tenn., or use the Request Card at page 18. Circle No. 42.

NEW-

Tow it into place

...Weir Contracting Co. tows their Heltzel Unitized, Mobilized Batching plant from previous job site on its own transportation wheels...

Heltzel's new 100 and 150-ton, pushbutton batching plants are now *unitized* and *mobilized* for easier moving—for faster setup—for greater savings of time and money.

The new plant consists of two self-contained mobile sections; hopper section and batcher section (including scales) with new fold-up supporting columns. Both sections have built-in wheel assemblies and towing tongues—ready to roll.

Weir Contracting Company of Detroit, Michigan reports: "... Our first job was in Greenbrier Meadows Subdivision, Livonia, Michigan. After the plant arrived on the site it was ready for operation in a very few hours. We found that the speed of batching will give two complete batches in thirteen seconds. On subsequent work, the plant was dismantled and ready for transportation in two hours and towed by small, single axle dump trucks to the new location. We have found that the built-in transportation wheels save us over $100.00 a move because of not having to rent trailers."

For complete data and specifications contact your nearby Heltzel representative—or write us direct.

Set it up fast

... batcher section is raised into position; hinged columns are lowered and bolted in place ...

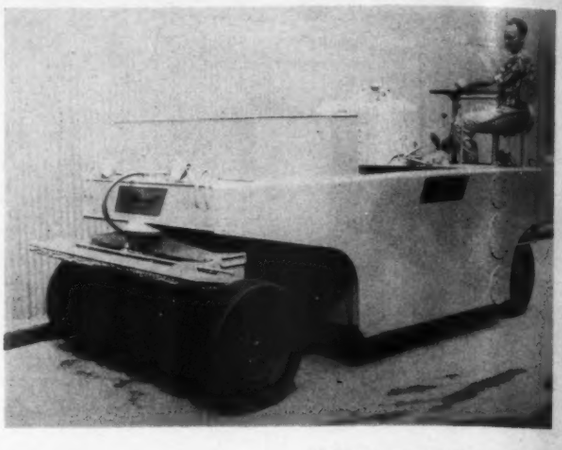
... bin section is positioned and bolted on top of batcher section.

Start batching

In just a few hours this full-size, high capacity, pushbutton paving plant is ready to operate!

THE HELTZEL STEEL FORM AND IRON COMPANY
WARREN, OHIO

The Model VP-11 is a self-propelled penumatic roller with vertically oscillating rear wheels for uniform compaction on uneven surfaces.



10-TON TILT TRAILER by WISCONSIN

Professionally Engineered
ONE-MAN OPERATION

Model No. 1000 only $1210.00 FOB factory w/ tires and deck.

Ideal for HD-5, TD-9 or similar equipment. Also for pipe, forms, and material. One man "easy up-easy down" automatic hydraulic tilt deck only 33" high. No skids or blocks needed. Exclusive rear deck channel construction will not break away when loading. Extra strong frame throughout. Wire enclosed. Compare and you'll choose Wisconsin.

Other models, 3 to 16 ton available.
Write for catalog, prices and name of nearest distributor.

WISCONSIN TRAILER CO. 1949 N. 121st St. Milwaukee 13, Wis.

For more facts, use Request Card at page 18 and circle No. 372

STOP PUSHER SHOCK with PUSHIN'-CUSHIN'

Speeds Up Production

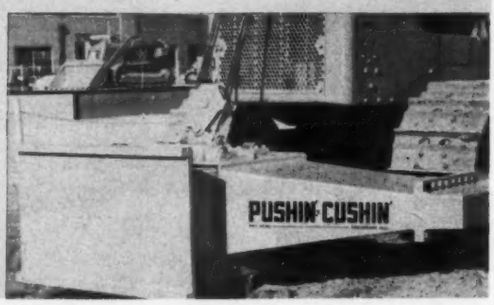
Speeds up cycle time by enabling Pusher to make non-stop connection with Scraper.
Twelve-inch stroke absorbs shock at speeds up to 6 MPH.
FULLY AUTOMATIC—there are no hydraulic controls for manual operation.
Self-contained hydraulic system, with no hoses to leak or get broken. No hydraulic pump to lose pressure or wear out.

◄ Model D-90-S

Cushions Operators & Equipment

The Cushin' connection guards against damage to equipment or operators.
Cushioning of the impact reduces fatigue on both scraper and pusher operators—helps them maintain a higher degree of efficiency.
It provides cost savings in reduced pusher and scraper maintenance by reducing shock loads.
For the protection of your equipment alone, you cannot afford to be without a Pushin'-Cushin'.

Model D-90 ►



Some Contractors Claim a 20% Production Increase!
See your dealer or write the manufacturer

PUSHIN'-CUSHIN', INC. Phone OLiver 7-3800 Box 107, Perry, Kansas

For more facts, use Request Card at page 18 and circle No. 373

Ohio Contractor Cuts Trench Filling Costs with Power-Pack

A. J. Baltes Highway Construction Company of Norwalk, Ohio uses a Power-Pack Hopper Conveyor to cut costs and speed up the job on two contract sections of Ohio's new North-South Thruway. This new method of back-filling has enabled the contractor to handle this phase of the job faster and more efficiently and to release more costly equipment for other types of work.

A Power-Pack and one operator handle all the fill hauled by six 18-ton tandem axle trucks, unloading each truck in 5 minutes or less. This machine transfers material from the truck placing it in the trench without spillage and to any depth desired. Production of 800 feet per hour is easily maintained.

If your job requires trench filling, road widening or shoulder work get the facts on Power-Pack today, there's a model to fit your requirements. See your dealer or write direct for information and specifications.

POWER-PACK CONVEYOR CO.
836 E. 140th St. - GLenville 1-7670 - CLEVELAND 10, OHIO

For more facts, use Request Card at page 18 and circle No. 374

New compaction roller has several improvements

The Southwest Welding & Mfg. Division of Yuba Consolidated Industries, Inc., announces an improved version of the Model VP-11 self-propelled roller.

Water-tank capacity has been increased to 100 gallons. Uniform cleaning of all wheels is accomplished by coco-mat brushes, hydraulically controlled from the operator's position. Available, if desired, is a complete lighting system.

The wider rolling width (84 inches) gives 15 to 20 per cent more rolling capacity. Single lever control and full-swiveling seat allow simple operation in both forward and reverse directions in shuttling.

For further information write to the Southwest Welding & Mfg. Division, Yuba Consolidated Industries, Inc., Dept. C&E, P. O. Box 71, Alhambra, Calif., or use the Request Card at page 18. Circle No. 98.

Announce new, automatic batching control system

A new push-button system for efficient automatic batching control for cement and aggregate is announced by Engineered Equipment, Inc.

The system features standardized components adaptable to fit any batching situation. Two-stage cutoff is provided, giving optimum accuracy and complete control over the batching cycle, states the manufacturer.

Included is a unitized jogging rotary valve or unitized jogging clam-shell gate, solenoid control valve, control system, sensing device, and connecting wiring.

For further information write to Engineered Equipment, Inc., Dept. C&E, 1001 Linden Ave., Waterloo, Iowa, or use the Request Card at page 18. Circle No. 19.

Mounted on a 31-foot chassis, this 28-foot steel body allows a maximum legal payload of 43,000 pounds.

ump-trailer bodies permit bigger payloads

An extra-long dump-trailer pack- designed to afford haulers the urity of a full-frame trailer, yet stantially reduce dead weight to et bridge laws of individual states, available from the Hercules Steel oducts Co.

The 28-foot corrugated steel bodies are mounted on a 31-foot chassis to obtain a maximum legal payload of 43,000 pounds. The bodies are also offered in aluminum construction.

For further information write to the Hercules Steel Products Co., Dept. C&E, Galion, Ohio, or use the Request Card at page 18. Circle No. 130.

w conveyor lubricator orks automatically

An automatic conveyor lubricator th a universal head that will pick trolleys of various makes on the ne conveyor is announced by the . N. Fauver Co., Inc.

The lubricator is a self-contained t that is mounted on the trolley l and actuated by the moving con- yor. A 12-pound reservoir and air ntrol panel are furnished as stand- d equipment. Each unit is com- tely adjustable as to the quantity lubricant discharged into each eel bearing.

For further information write to . N. Fauver Co., Inc., Dept. C&E, 51 W. Hancock, Detroit 1, Mich., or use e Request Card at page 18. Circle o. 14.

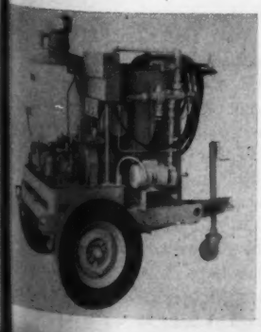
dd three new models steam-cleaner line

The Clayton Mfg. Co. adds three w steam cleaners to its heavy-duty e, with the introduction of the l-fired, weatherproof Series 280 and 3-828 skid, portable, and trailer- unted units.

Features include weatherproof ectric components and stack hood, d heavy-duty steel skids with hook s for crane lift, to make for sim- e, efficient leading on any standard -ton pickup truck.

The trailer-mounted unit is unted on two tires with standard iler hitch and spring-mounted ngle axle.

For further information write to e Clayton Mfg. Co., Dept. C&E, Box 4, El Monte, Calif., or use the Re- est Card that is bound in at page Circle No. 88.



For more facts, circle No. 375→

UDT-817 power crushes 300 cu. yd. of 1¾-in. minus caleche rock hourly

This is a Texas-sized crushing job—300 cu. yd. of caleche crushed to 1¾-in. minus size hourly—and the new 6-cylinder turbocharged International UDT-817 diesel does it with power to spare.

The West Texas Construction Co., Lubbock, is crushing 20,000 yd. of caleche for road base material at this pit near Perryton for a 5-mile state road improvement contract. The big new International UDT-817 power unit is delivering only 265 cont. hp. @ 1800 rpm. on the Universal impact crusher with production being limited only by feeder capacity. About 85% of the caleche requires crushing.

Other International power on the job includes a UD-18A diesel on the Jaeger 315 air compressor operating the wagon drill boring dynamite holes and a carbureted U-264 engine on the Universal feeder.

While the new 385 hp. UDT-817 diesel heads up the International engine line, you can choose from 31 other diesel and carbureted models ranging upward from 16.5 hp. Save on repowering and operating costs by checking your International Power Unit Distributor or Dealer or by specifying dependable International power in new machines. All 32 International engines have one common feature: Fastest payback power.

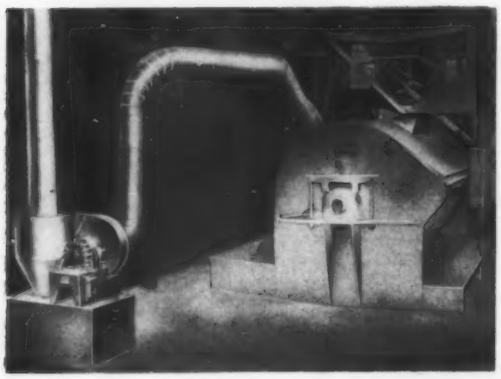
MAJOR POWER SOURCE for this portable Universal crusher is the new International UDT-817 diesel on the impact crusher. Feeder power is supplied by an International U-264 carbureted power unit. Conveyors and screens are electric powered. Output: 300 cu. yd. of caleche crushed to 1¾-in. minus size hourly.

International® Construction Equipment

International Harvester Co., 180 North Michigan Ave., Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers and Bottom Dump Wagons . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

For further information on any product described in this section, circle the indicated number on the Request Card at page 18.



To combat the dust problem created when a batch weigher dumps its load into the mixer, the Aget Mfg. Co. offers a device known as the Dustkop. As the batcher moves into dumping position, it trips a switch that starts the Dustkop in operation. The unit sucks air into the mixer through joints and cracks and creates a negative pressure within that prevents batching dust from escaping. The dust held inside the mixer is then carried through the exhaust pipe to the separator. Here, dust and air are separated—the dust exhausted into a storage bin, the clean air into the outside building vent. Standard Dutkop models are available to fit any size equipment. For further information write to the **Aget Mfg. Co.**, Dept. C&E, Adrian, Mich., or use the Request Card at page 18. Circle No. 132.

EQUIPMENT HAULING *the easy way!*

HAUL MEDIUM WEIGHT CONSTRUCTION EQUIPMENT, PORTABLE BUILDINGS, TOOLS, AND MACHINERY EASILY AND ECONOMICALLY.

SCHWARTZ

RAMP HOIST
WITH WINCH

- Fits all trucks 84" to 154", cab to axle.
- Hydraulically operated with controls at the side of the ramp.
- Mounts without removing truck frame cross member.
- Load rating—up to 12 tons.
- Rugged power hydraulic winch operated off truck power take-off.
- Available with wood or steel platform with steel approach plate and steel cab protector.
- Hinge point located over rear spring shackle for better stability and less stress on truck frame.

AVAILABLE ALSO IN HEAVY DUTY MODELS FOR TANDEM AXLE TRUCKS

SCHWARTZ MAKES IT A **ONE-MAN** JOB!

Now, with a SCHWARTZ RAMP HOIST, *one man* can load, transport, and unload those hundred and one pieces of equipment that do not justify the use of heavy duty low-boy trailers. With the ramp lowered, both mobile and other equipment can be winched onto the ramp and safely transported. The low cost of the SCHWARTZ RAMP HOIST will be quickly paid for in savings on time and labor.

WRITE TO DEPT. RH-20 for complete information.

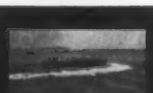
SCHWARTZ

SCHWARTZ MANUFACTURING COMPANY
Lester Prairie, Minnesota

For more facts, use Request Card at page 18 and circle No. 376

HARBORMASTERS

solve tough marine power and steering problems!



Steer in any direction with full power

Rugged, powerful, easily installed

Shallow water protection

Economical operation and maintenance

Harbormasters are complete, heavy duty marine power packages, quickly and easily installed for immediate use. They are efficient, economical to operate and maintain . . . and they give you many special features not found with ordinary marine power. They are ideal for shallow or deep water, for coastwise service, as well as in harbors, lakes, canals, and rivers.

In hundreds of installations Harbormasters are moving bigger payloads at less cost, in less time. *Send for catalog and get complete details.*

MURRAY & TREGURTHA, INC.

44 Hancock Street, Quincy 71, Massachusetts

For more facts, circle No. 377

fast, dependable snow plow action

with MONARCH **POWER**

HYDRAULIC CONTROLS

Lift and lower the snow plow right from the cab . . . automatically . . . with Monarch Power Hydraulic Controls. Snow removal is easier, faster, more economical with Monarch. Instant up-and-down action with the flick of a wrist. See your dealer or write for illustrated folder.

DYNA-MIGHT
Battery-Operated

HY-LO-JACK HY-LO-JEEP

Fan-Belt Driven

MONARCH ROAD MACHINERY COMPANY
1331 Michigan St., N. E. — Grand Rapids 3, Michigan

For more facts, circle No. 378

Overhauling balls feature 5 and 8½-ton capacities

Two new models in the Miller swiveling headache ball series are announced.

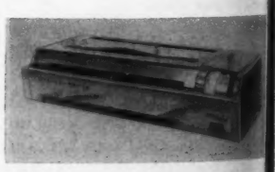
The Model HB8 is a 100-pound, 8-inch-diameter ball with a 5-ton capacity. The HB12 is a 265-pound, 13-inch-diameter ball with an 8½-ton capacity.

Both units are available in the standard four types for easy rigging: clevis, eye, wedge, and thimble.

For further information write to Miller Swivel Products, Inc., Dept. C&E, P. O. Box 938, Pomona, Calif., or use the Request Card at page 18. Circle No. 86.

Reproduction speed increased on photocopier

A new speed-feed feature for faster insertion of documents has been incorporated in the Dial-A-Matic Auto-Stat photocopy machine made by the American Photocopy Equipment Co.



According to the manufacturer, only 19 seconds is required for reproducing any original document up to 15 inches in width.

The new feature consists of specially designed rollers that clamp the document being inserted and guide it automatically. This simplifies the operator's job, as well as speeding up the copying cycle. A single on-off switch operates the new model.

For further information write to the American Photocopy Equipment Co., Dept. C&E, 2100 W. Dempster St., Evanston, Ill., or use the Request Card at page 18. Circle No. 107.

Mobile air-power unit designed for lubrication

A new all-purpose mobile air-power unit is announced by the Campbell-Hausfeld Co.

Known as the Tankmobile Jr., the unit features a heavy-duty Pressure Princess single-cylinder air compressor on a welded-steel 7½-gallon tank. Designed with a low center of gravity and semipneumatic 8-inch rubber-tire wheels, it is said to be especially efficient for lubrication.

Models are available with a ½-hp capacitor motor or a ⅓-hp split-phase motor. An air chuck and 15 feet of ¼-inch air hose are standard equipment.

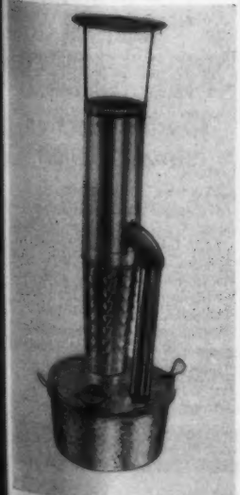
For further information write to the Campbell-Hausfeld Co., Dept. 1262, 801 Moore St., Harrison, Ohio, or use the Request Card at page 18. Circle No. 139.

Oil-burning salamander has galvanized bowl

A new oil-burning salamander is available from the Nugent Corp.

Features include alloyed cast-iron elbow; 24-gage hot-dipped galvanized bowl; riveted bracket clips; a 2-piece jack to reduce repair and storage cost; and heavier diffusion hood and brackets.

For further information write to the Nugent Corp., Dept. C&E, 4400 Superior Ave., Cleveland 3, Ohio, or use the Request Card at page 18. Circle No. 71.



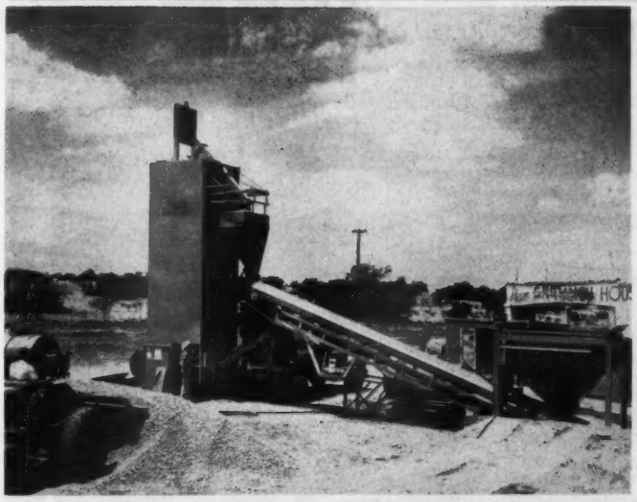
This road-maintenance machine combines in one unit all of the equipment necessary to repair and recondition asphalt pavements. Known as the Cutler Repaver, it heats the pavement, then levels, mixes, and compacts it. Excess hot-mix shaved from the high spots is picked up in a heated storage bin and retained there for filling holes and depressions in the roadway. This operation can be carried on at the rate of 200 to 300 square yards per hour, according to the manufacturer. For further information write to the **Cutler Engineering Co.**, Dept. C&E, 5435 W. 63rd St., Chicago 38, Ill., or use the Request Card at page 18. Circle No. 140.

THE PERFECT COMBINATION . .

HIGH PRODUCTION . . .

LOW COST . . .

COMPLETE VERSATILITY . . .



The Ross Porta-Plant team . . . the perfect combination for complete ready-mix batching . . . high production at low initial cost. A team designed for economical, simple, easy operation . . . giving maximum performance and years of trouble-free use.

All Ross products are engineered for true portability.

PORTABILITY IS NO SIDE-LINE WITH US!

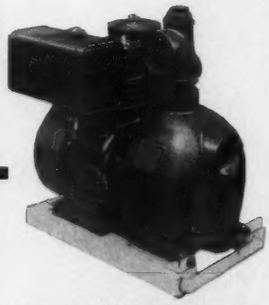
Contact us for the name of the Dealer nearest you.

ROSS PORTA-PLANT

BOX 446 PHONE MI 5-2697 BROWNWOOD, TEXAS

For more facts, use Request Card at page 18 and circle No. 379

NOW...You Can Pick the HALE Pump That Serves Your Purpose BEST!



"Torrent" Model 30-T, 3" *(illustrated)*
Model 15-T, 1½"
Model 20-T, 2"
Model 25-T, 2½"

No matter what your de-watering problem may be, there's a Hale pump to handle it and at the lowest possible cost . . . because Hale has added Diaphragm pumps to its line of "Torrent" centrifugal pumps.

Now Hale can offer you a pump for moving high volumes of water fast; for constant, positive control of seepage; or for trouble-free pumping of high-solid-content water. In fact, there's a Hale pump for practically every type of pumping job.

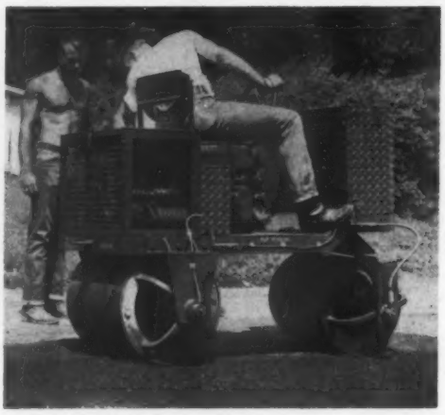
Diaphragm Type 30DP, 3" *(illustrated)*
Type 40DP, 4"
Type 20DP, 2"
Type 15DP, 1½"

Write *today* for FREE Handy Pump Selector File

HALE FIRE PUMP COMPANY
CONSHOHOCKEN, PA.

HALE . . . *manufacturers of custom designed equipment for industrial and contractors' use*

For more facts, use Request Card at page 18 and circle No. 380



A propane tank supplying fuel to burners within each roller enables the Ellis machine to achieve increased compaction.

One-ton asphalt roller develops more compaction

A new 1-ton asphalt roller said to develop more compaction than an ordinary 5-ton tandem roller is announced by the Ellis Mfg. Co.

The machine carries a propane tank, supplying fuel to burners within each roller; according to the manufacturer, it is the application of heat that enables this roller to achieve greater compaction than the heavier machine.

A Wisconsin 7-hp air-cooled engine powers the unit through a chain drive to the rear roller. The fro roller has a diameter of 18 inche the rear roller is 21 inches in dia eter; and steering is achieve through a worm gear. The machin operates forward and reverse wit an engine ratio of 50:1. No brak are required.

For further information write t the Ellis Mfg. Co., Dept. C&E, Li erty, Mo., or use the Request Car that is bound in at page 18. Circl No. 99.

STABILIZE ROADBED THE ROME WAY

Proved on the toughest clearing and construction jobs

Matched to track-type or high speed earthmovers

Rome Disk Plowing Harrows are used on all the Turnpike Jobs and many of the new Interstate Highway Jobs to:

AERATE the borrow pits, and fill after a rain so the earthmovers can get to work hours sooner.

CUT and mix the fill when water must be added.

LOOSEN and smooth the fill surface to assist in the bonding of new lifts.

BLEND layers of stone and other base material.

MIX soil cement and sand asphalt base work on secondary roads.

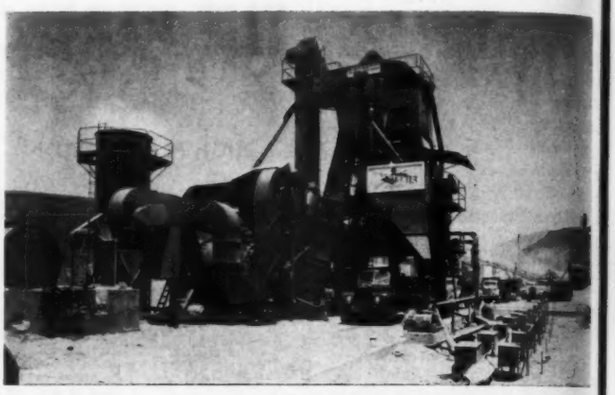
Make the Rome Disk Plowing Harrow a member of your construction equipment team.

Ask your Rome-Caterpillar Dealer for a demonstration. Rome Plow Company, Cedartown, Georgia.

ROME.

YOUR ROME DEALER IS YOUR CATERPILLAR DEALER

For more facts, use Request Card at page 18 and circle No. 381



Designed to meet the most rigid air-pollution codes, Barber-Greene's Models CN-50, 60, and 70 wet collectors are offered for use with all sizes of the firm's continuous-mix and batch-type asphalt plants, as well as for application to asphalt plants of other makes. These collectors utilize a dual-compartment design, dividing the wetting and recovery phases for finest control over each phase. Because the wet collectors are equipped with independent fans and power units, they impose no additional back pressure on the dryer and dry-dust collector. The unit shown is a Model CN-70, in use on a Barber-Greene Model 896 BatchOmatic 6,000-pound batch plant. For further information write to the **Barber-Greene Co.**, Dept. C&E, 400 N. Highland Ave., Aurora, Ill., or use the Request Card at page 18. Circle No. 68.

Fast-Driving, Versatile

VULCAN DGH-100 PILE HAMMER

speeds work on sewer project

The Vulcan DGH-100 P Differential-Acting Hammer ing 3" x 8" x 24' timbers to of 20 feet to form bins 8' wid 24' long used in the construction a sewer line in Edina, a subu Minneapolis. Contractor: Ph Drake Co., Minneapolis. The V DGH-100 is a favorite with cont tors everywhere.

Ask for full information

Manufacturers of Pile Driving Hammers and Piling Extractors Since 19

VULCAN IRON WORKS INC. 327 North Bell Avenue, Chicago 12, Illinois

For more facts, use Request Card at page 18 and circle No. 382

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The forward location of the spinner lets the operator observe the thoroughness of the spread, which gives extra traction to the rear wheels.

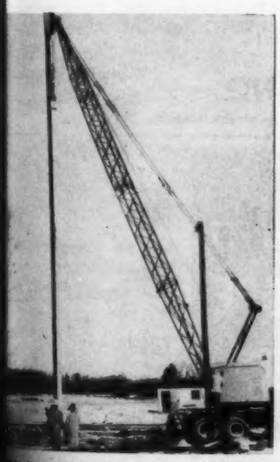
...ice-control spreader ...has unique conveyor

A one-piece chainless, beltless, lightless 24-inch conveyor is the ma- ...ure feature of the new Hi-Way Model ...ice-control spreader. The all-steel ...nveyor system uses an oscillating ...tion to move material.

The Model Y is operated by one ...an from the cab. An 18-hp rear- ...ounted engine drives the conveyor ...d hydraulic system. The 20-inch ...inner is hydraulically operated and ...s said to spread from 2 to 4 lanes ...ide with ease.

For further information write to ...e Highway Equipment Co., Dept. ...20-5, Dept. C&E, 616 D Ave. N. W., ...Cedar Rapids, Iowa, or use the Re- ...est Card at page 18. Circle No. 66.

For further information on any product described in this section, circle the indicated number on the Request Card at page 18.



...is diesel pile hammer, owned by the ...rington Construction Co., Richmond, ..., is shown driving 12-inch prestressed- ...crete piling on the Richmond-Peters- ...g Turnpike with a truck crane, in ...der. A Delmag Model D-12, it weighs ...140 pounds and has a manufacturer's ...gy rating of 22,500 foot-pounds ...r blow. Delmag hammers may be ...erated in either conventional steam- ...mer leads or open-type leads. On ...e Richmond-Petersburg Turnpike, the ...rington Construction Co. drove pre- ...ssed-concrete piling ranging in ...gth from 20 to 85 feet. For further ...rmation on Delmag pile hammers, ...te to the **Foundation Equipment** ..., Dept. C&E, 100 Elizabeth St., ...Cumberstown, Ohio, or use the Re- ...est Card at page 18. Circle No. 111.

WINSLOW—PORTABLE TRUCK SCALE

THE CONTRACTORS' SPECIAL SCALE

For use at temporary and permanent locations—at stock piles and by bituminous material contractors at the job site. Capacity: 15-18-20-30, 40 and 50 tons.

Write us for name of your nearest distributor.

WINSLOW SCALE COMPANY P.O. Box 1198 Terre Haute, Indiana

For more facts, use Request Card at page 18 and circle No. 383

More capacity...size for size!

Crosby-Laughlin Load-Rated® Shackles

Designed to new safety standards

- **Heat treated alloy pins**
- **Guaranteed capacity**
- **50% stronger than ordinary shackles**
- **Safe working load forged in every shackle**

Stocked and sold by leading mill supply, construction and industrial equipment distributors.

Write for FREE specifications catalog listing the most complete line of drop forged fittings for wire rope and chain.

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CROSBY-LAUGHLIN *Division*

AMERICAN HOIST & DERRICK COMPANY

FT. WAYNE, INDIANA

Manufacturers of Crosby Clips and "Load-Rated" Blocks . . . Crosby-Laughlin "Load-Rated" Fittings . . . Lebus Load Binders and Snatchblocks.

For more facts, use Request Card at page 18 and circle No. 384

Concrete mix would grind the markings off most tapes!

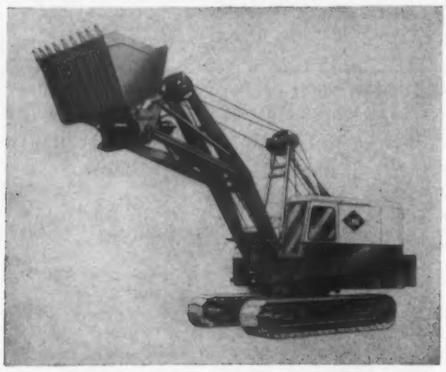
This is Lufkin's Mezurall® tape . . . with unmatched Chrome Clad® blade that fights concrete, sand, mud and other abrasives.

Lufkin starts with a special tempered steel . . . bonds the markings to it. Then layer after layer of electroplating is applied, topped by a final layer of tough chrome. There's no other blade like it. Comes in 6′, 8′, 10′ and 12′ lengths . . . either ½″ or ¾″ widths. The Lufkin Rule Company, Saginaw, Mich.

THE LUFKIN RULE COMPANY

TAPES • RULES • PRECISION TOOLS

For more facts, use Request Card at page 18 and circle No. 385



The 5-cubic-yard-capacity Lima loader features a 9-foot 10-inch horizontal movement of the bucket and a 360-degree swing.

5-yard loader reduces digging, loading time

A 5-cubic-yard loader that does its own digging and converts quickly into a shovel, crane, dragline, or pull shovel is offered by the Construction Equipment Division of the Baldwin-Lima-Hamilton Corp.

The unit, designated Type 64, features a 9-foot 10-inch horizontal movement of the bucket and a 360-degree swing.

The bucket, of special design to insure maximum capacity and clean dumping, has a maximum dumping height of 16 feet 10 inches at an 18-foot radius.

A choice of diesel or gasoline power is offered. A torque converter is standard equipment.

Quick and simple field conversion permits turning the Lima loader into a 1¼ or 1½-yard shovel; a 40 or 50-ton crane; a 1¼ or 1½-yard pull shovel; or a variable-capacity dragline.

For further information write to the Baldwin-Lima-Hamilton Corp., Construction Equipment Division, Dept. C&E, P. O. Box 431, Lima, Ohio, or use the Request Card at page 18. Circle No. 129.

Your Key to Efficient, Economical Buying

F85 ALLOY, HARD EDGE AND CARBON ELECTRIC FURNACE STEEL CASTINGS

F85 FC

- ✓ SPECIFICATIONS
- ✓ CATALOG NO. 21 — SPROCKETS
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- ✓ CATALOG NO. 23 — CONVEYING NEEDS
- ✓ CATALOG NO. 24 — WHEELS AND ROLLERS

WRITE TODAY FOR THE LITERATURE YOU NEED

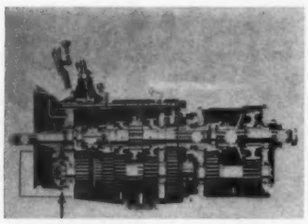
FARRELL-CHEEK STEEL COMPANY
SANDUSKY, OHIO, U.S.A.

BUCKETS • SPROCKETS • CHAIN • WHEELS • GEARS • SHEAVES • CABLE FITTINGS • BAR BENDERS, CUTTERS • R. R. CASTINGS • FIRE TOOLS, ETC.

For more facts, circle No. 386

Countershaft brake is standard on transmission

To permit fast, easy shifts without double clutching, the Fuller Mfg. Co. has incorporated an air-powered countershaft inertia brake as standard equipment on all Fuller transmissions designed for heavy-duty, off-highway service.



The arrow in the lower lefthand corner points to the Fuller countershaft inertia brake.

Preselected by the operator simply by pressing a button, the countershaft brake slows the rotation of the transmission countershaft, main drive gear, and clutch-driven plate or plates. Actuation is automatic as the transmission is shifted through neutral, and, because there is no need for the operator to double-clutch, deceleration is held to a minimum.

For further information write to the Fuller Mfg. Co., Dept. C&E, Kalamazoo, Mich., or use the Request Card at page 18. Circle No. 45.

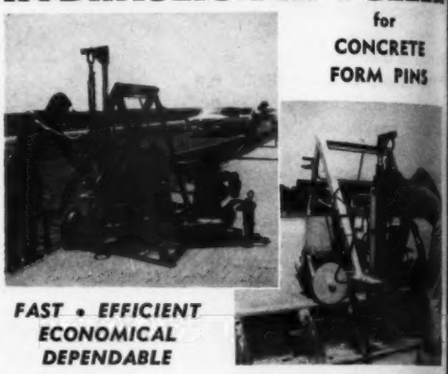
Portable photocopier is high-capacity unit

A new Genco Porta-Fax photocopying machine, available from the General Photo Products Co., Inc., automatically exposes, processes, and prints 60 to 120 sharp, error-free copies per hour. According to the company, it reproduces anything printed or written up to 9¼ inches wide by any length, including colors and ball-point pen.

Completely self-contained, this Porta-Fax weighs 15 pounds and measures 18×6×10 inches high.

For further information write to the General Photo Products Co., Inc., Dept. C&E, General Photo Bldg., Chatham, N. J., or use the Request Card at page 18. Circle No. 56.

HYDRAULIC PIN PULLER for CONCRETE FORM PINS



FAST • EFFICIENT ECONOMICAL DEPENDABLE

THE COMPACT SIMPLICITY and high speed performance designed into this tool makes it possible for one man to pull effortlessly several hundred form pins per hour regardless of pin length or form size.

HYDRAULIC MOTOR OPERATED with single-hand lever propels machine both forward and reverse for easy maneuverability and quick spotting over the pin.

FOR FURTHER INFORMATION and free demonstration, consult your local PEMCO dealer or contact factory direct.

PEMCO, INC.
7 North Roselle Road
Roselle, Illinois

For more facts, circle No. 387

THE MORSE-STARRETT WIRE ROPE CUTTER

Cutting capacities up to 1 inch, 1-1/16 inch, and 1-1/2 inch.

FAST
Especially designed cutting blade and dies of the finest steel assure fast cutting action.

EASY
Anyone can operate it. The hammer principle eliminates any special skill requirements.

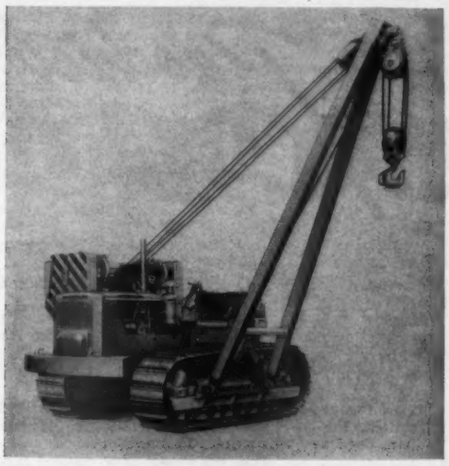
SAFE
The enclosed cutting blade locked in the body of the cutter assures perfect safety.

PORTABLE
Models for tool kit or stationary operation. Made in three sizes.

SEE YOUR DEALER OR WRITE TO
MORSE-STARRETT PRODUCTS COMPANY
1204 - 49th AVENUE OAKLAND 1, CALIFORNIA

For more facts, circle No. 388

The Caterpillar No. 572 Series D pipelayer is powered by a turbocharged engine rated at 140 flywheel horsepower. Other features include a dry-type air cleaner and lifetime lubricated rollers.



Announce improvements on pipe-laying machine

A new No. 572 Series D pipelayer, said to have increased working ability and durability, is announced by Caterpillar Tractor Co.

Lifetime lubricated track rollers, carrier rollers, and idlers are standard.

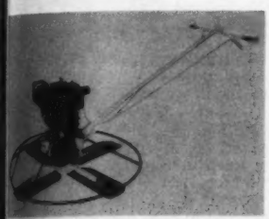
Winch speeds have been increased for faster pipe handling. New line speeds are: first gear, 106 fpm; second gear, 214 fpm; and third gear, 413 fpm. Lowering speed has been increased from 222 to 230 fpm.

A noteworthy engine change is the addition of a turbocharger, which aids in increasing engine flywheel horsepower from 128 to 140. Engine torque rise has been increased 80 per cent, and engine rpm has been advanced from 1,200 to 1,240.

For further information write to the Caterpillar Tractor Co., Dept. C&E, Peoria, Ill., or use the Request Card at page 18. Circle No. 38.

Concrete trowel machine has 43-inch diameter

The Champion Mfg. Co. announces a new concrete troweling machine designated Model 430-G.



The unit features a 43-inch trowel diameter and is powered by a Briggs-Stratton 5-hp engine. It is available in a 3-blade model and a 4-trowel model.

Other features include a stationary guard ring for safety and to allow troweling up to obstructions, and a dead-man safety grip.

For further information write to the Champion Mfg. Co., Dept. C&E, 2700 Forest Park Ave., St. Louis 8, Mo., or use the Request Card at page 18. Circle No. 94.

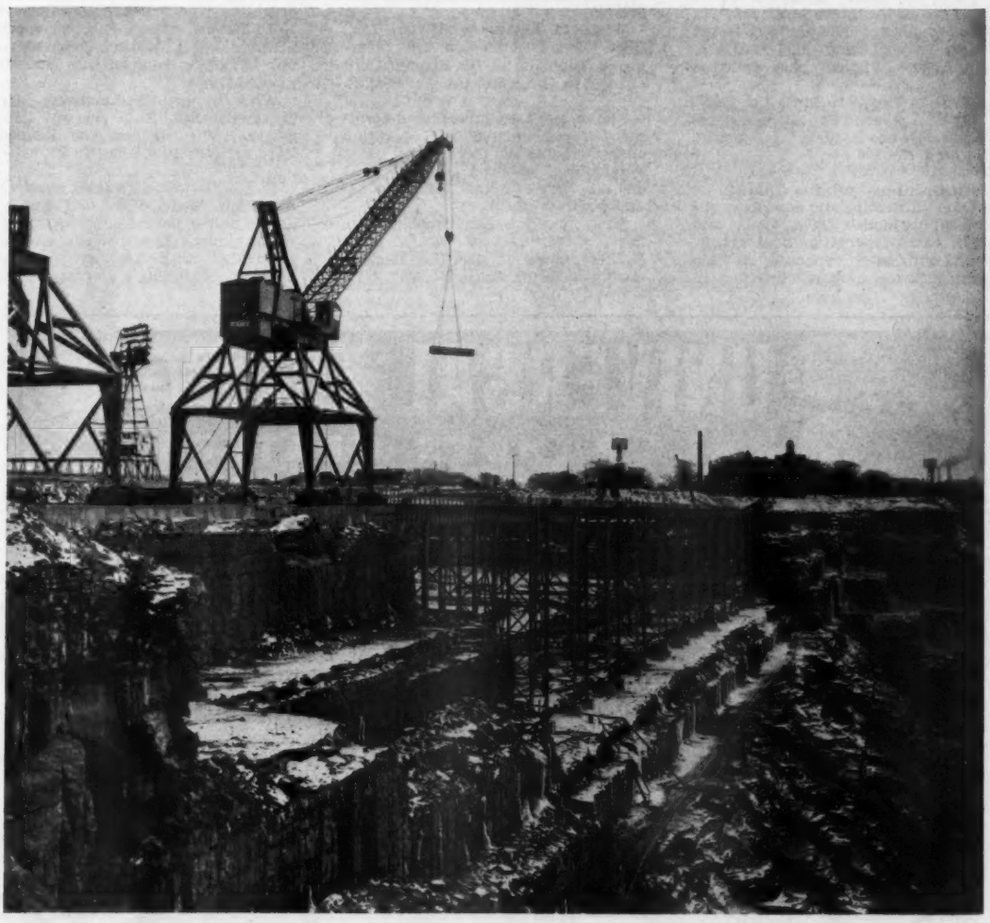
CONCRETE TESTERS

THE WORLD'S FINEST LOW COST PLANT AND JOB-SITE TESTERS For CYLINDERS CUBES BLOCKS BEAMS PIPE

IF IT'S A CONCRETE TESTER YOU NEED-GET IN TOUCH WITH

FORNEY'S, Inc.
TESTER DIVISION
P. O. BOX 310 - NEW CASTLE, PA.

For more facts, circle No. 389



Bethlehem wire rope along the Niagara. One of the country's busiest construction jobs is the Niagara Power Project now in full swing near the famous Falls. Being built under the direction of the Power Authority of the State of New York, it will harness the maximum potential on the American side of the Niagara River. Bethlehem wire rope is in constant use at many locations on the Niagara Power Project. Lifting a variety of heavy loads, and moving thousands of tons of earth and rock, it is providing the same dependable service as on less spectacular construction jobs throughout the nation.

Upon completion, this project will have an installed capacity greater than Grand Coulee Dam, currently the country's largest hydroelectric development. A new intake gate structure above the Falls will divert river water through four miles of underground conduits and one mile of open canal to the main 1,950,000 kw power plant. In addition, a pump-generating plant will produce an additional 240,000 kw during periods of peak demands. Treaty restrictions limit the amount of water which can be diverted from the river for power purposes, assuring that the grandeur of the Falls will in no way be diminished for tourists.

Bethlehem Steel Company, Bethlehem, Pa. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem wire rope

BETHLEHEM STEEL

BETHLEHEM WIRE ROPE

For more facts, use Request Card at page 18 and circle No. 390

Product LITERATURE

To obtain free copies of any of the literature described in the following section, circle the designated number on the Request Card at page 18.

Concrete work in winter—an illustrated folder giving cold-weather concreting hints for successful placing, finishing, and curing. Covers such subjects as heat while curing, removing forms, and antifreeze mixtures.

Write to the Alpha Portland Cement Co., Dept. C&E, 15 S. Third St., Easton, Pa., or use the Request Card at page 18. Circle No. 39.

Sand-spreader attachment—a brochure on the Smith sand spreader, designed for any 1954 or later model Smith transit mixer (4½-yard size and larger). Photographs, drawings illustrate text.

Write to The T. L. Smith Co., Dept. C&E, 2835 N. 32nd St., Milwaukee 10, Wis., or use the Request Card at page 18. Circle No. 106.

Bituminous mixing plants—a catalog illustrating and describing the Cedarapids Models G40A, G50A, and G60A batch-type bituminous mixing plants with batch capacities to 7,500 pounds. Stresses self-erecting feature and availability of fully automatic controls.

Write to the Iowa Mfg. Co., Dept. C&E, 916 16th St. S. E., Cedar Rapids, Iowa, or use the Request Card at page 18. Circle No. 108.

Submersible pumps—a bulletin on Layne & Bowler submersible pumps. Contains detailed cross-section drawings, plus colored illustrations of the pumps' many and varied uses and applications. Bulletin No. 202.

Write to Layne & Bowler, Inc., Dept. C&E, 1993 Chelsea Ave., Memphis 8, Tenn., or use the Request Card at page 18. Circle No. 147.

Space heater—literature describing the construction and operating characteristics of the Lennox Heat Wagon, an oil-fired portable unit heater. Photographs, dimensional drawings, specifications.

Write to the Lennox Furnace Co., Dept. C&E, 1701 E. Euclid, Des Moines, Iowa, or use the Request Card at page 18. Circle No. 82.

Low-bed trailer—a brochure on Transport Trailers' Model GTRY removable gooseneck, triple-axle, low-bed semitrailer. Illustrated, with specifications. Bulletin GTRY-659.

Write to Transport Trailers, Inc., Dept. C&E, 1200–34 12th St. S. W., Cedar Rapids, Iowa, or use the Request Card at page 18. Circle No. 103.

Brushless generators—a bulletin describing the characteristics of Allis-Chalmers high-speed, packaged brushless synchronous generators in 40 to 300-kw ratings. Provides specifications and is illustrated with close-ups of major components. Bulletin No. 51B9192.

Write to the Allis-Chalmers Mfg. Co., Dept. C&E, P. O. Box 512, Milwaukee, Wis., or use the Request Card at page 18. Circle No 32.

Welder—a specification sheet on the P&H Model WNG-200 engine-driven welder for construction, maintenance, pipeline, and repair welding. Illustrated with photographs and drawings, including a close-up of the control panel to emphasize precurrent control.

Write to the Harnischfeger Corp., Dept. C&E, 4400 W. National Ave., Milwaukee 46, Wis., or use the Request Card at page 18. Circle No. 8.

Helicopter—a booklet on the Hiller Model 12E 305-hp helicopter. Discusses the benefits of the aircraft in surveying, equipment and repair supply, and transport of supervisory personnel. Gives brief performance specifications and information on operator services. Illustrated with photographs.

Write to the Commercial Division, Hiller Aircraft Corp., Dept. C&E, 1 Willow Road, Palo Alto, Calif., or use the Request Card at page 18. Circle No. 112.

Cold-weather concreting—a bulletin on placing concrete safely in cold weather with Berylex cement compound. According to the literature, Berylex concrete will not be affected by the number of times temperature drops far below freezing. Technical Bulletin No. 102.

Write to Berylex National, division of Harry Warde & Co., Inc., Dept. C&E, P. O. Box 33, Roselle Station, Kansas City 3, Kans., or use the Request Card at page 18. Circle No. 105.

Off-highway hauler—a bulletin on the Koehring Model 100 Dumpster, a 10-yard-capacity off-the-road hauling unit. Features on-the-job views, blowups of component parts, and drawings to illustrate and describe the machine's 2-way controls, instantaneous (and controlled) gradedump, and its ability to increase yardage hauled through its no-turn operation. Bulletin K-618.

Write to the Koehring Division, Koehring Co., Dept. C&E, 3026 W. Concordia Ave., Milwaukee 14, Wis., or use the Request Card at page 18. Circle No. 133.

Soil testing—a bulletin describing the Acker vane-shear test method of in-place soil testing. Sixteen drawings and photographs clearly illustrate procedure and necessary data. Bulletin No. 700-R.

Write to the Acker Drill Co., Inc., Dept. C&E, P. O. Box 830, Scranton 2, Pa., or use the Request Card at page 18. Circle No. 49.

Motor grader—a bulletin on the Caterpillar No. 14 motor grader. The new machine features turbocharged 150 horsepower, oil clutch, dry-type air cleaner, split side-shift mechanism, heavy-duty circle and moldboard, and a complete line of attachments. Form 33456.

Write to the Caterpillar Tractor Co., Dept. C&E, Peoria, Ill., or use the Request Card at page 18. Circle No.

Starting fluid—literature on the benefits of Spray starting fluid for diesel and gasoline engines. The fluid reportedly can be sprayed in temperatures ranging to 65 degrees below

Write to the Spray Products Co., Dept. C&E, P. O. Box 844, Camden, N. J., or use the Request Card at page 18. Circle No. 69.

Transit mixers—literature giving full details on three lines of Heltzer Galion transit mixers: S-Series standard aratengine models in 5, 6, and 7-yard capacities: M-Series Mixmaster models with front-of-engine P.T.O. drive in 5, 6, and 7-yard capacities

Improved Return Stack Assures Complete Combustion and Consumes Carbon Deposits and Fumes

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Manufacturers of Portable Space Heaters for over 50 years Phone: OVerland 3-7254

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A MUST FOR POURING CONCRETE IN WINTER
GLASS FIBER ENCLOSED IN POLYETHELENE
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Manufactured by A. H. BENNETT COMPANY

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...d the T-Series straight PTO drive ... 4-yard capacity. Also contains ... on the firm's portable batching ...

Write to Hercules Galion Products, ... Dept. TM, Dept. C&E, Galion, ..., or use the Request Card at page ... Circle No. 7.

Aggregate washing plants—a ...letin describing the new Pioneer ...e of Hydro-Screen washing plants. ...tains a drawing of the basic plant, ... well as drawings of several differ... models designed to meet specific ...regate washing problems. Specifi...tions, on-the-job photos, cutaway ...w of the Hydro-Screen. Bulletin ...690.

Write to Pioneer Engineering, divi... of Poor & Co., Inc., Dept. C&E, ... Como Ave. S. E., Minneapolis ..., Minn., or use the Request Card at ... 18. Circle No. 30.

Propeller and mixed-flow pumps—a bulletin on Layne propeller and mixed-flow pumps. Includes cutaway drawings, installation sketches and measurements, delivery and performance tables, plus complete information on all uses and applications of these pumps. Bulletin No. 350.

Write to Layne & Bowler, Inc., Dept. C&E, 1993 Chelsea Ave., Memphis, Tenn., or use the Request Card at page 18. Circle No. 12.

Concrete form panels—a booklet on Uni-Form concrete form panels. Generously illustrated with drawings and photographs. Separate section covers form ties.

Write to the Universal Form Clamp Co., Dept. C&E, 1238 N. Kostner Ave., Chicago 51, Ill., or use the Request Card that is bound at page 18. Circle No. 75.

Asphalt-pavement surface seal—newly revised literature describing Jennite J-16, a surface seal for asphalt pavements. Lists major causes of asphalt deterioration and explains how these can be retarded with Jennite J-16. Application methods outlined in detail.

Write to Maintenance Inc., Dept. C&E, W. Liberty St. Extension, Wooster, Ohio, or use the Request Card at page 18. Circle No. 2.

Conversion factors—a conversion-factor reference table in wall-chart form. Includes common conversions such as inches to centimeters or watts to horsepower, as well as many conversions that are difficult to locate in reference manuals.

Write to the Precision Equipment Co., Dept. C&E, 4411E Ravenswood Ave., Chicago 40, Ill., or use the Request Card at page 18. Circle No. 148.

Compressors, air tools—a revised bulletin on Le Roi portable and Tract-air compressors and air tools. Contains several on-the-job photographs; brief specifications are included. Bulletin No. CG-15.

Write to the Le Roi Division, Westinghouse Air Brake Co., Dept. C&E, 1706 S. 68th St., Milwaukee, Wis., or use the Request Card at page 18. Circle No. 134.

Brazing—a brochure describing the new Rexarc Twin Liquifluxers and Liquiflux, and designed to answer many questions regarding the varied applications in the brazing process. Text illustrated with drawings and photographs. Rexarc Form No. 659.

Write to The Sight Feed Generator Co., Dept. C&E, 38 E. Third St., West Alexandria, Ohio, or use the Request Card at page 18. Circle No. 26.

(*Continued on next page*)

To obtain the literature described on this page, write to the manufacturer or circle the designated number on the Request Card at page 18.

Bridge bearing pads—literature describing Herco neoprene absorbent bridge and industrial bearing pads. Illustrated with photographs and dimensional drawings. Brief specifications given.

Write to Herco Rubber Crafters, division of the Hecht Rubber Co., Inc., Dept. C&E, 482–484 Riverside Ave., Jacksonville 2, Fla., or use the Request Card at page 18. Circle No. 149.

Crawler crane-excavator—a 24-page catalog on the American 500 Series 40-ton crawler crane-excavator. Describes and illustrates the unit's mobility, as well as its easy convertibility to crane, dragline, clamshell, shovel, backhoe, pile driver, or for special grapple work.

Write to the American Hoist & Derrick Co., Dept. C&E, 63 S. Robert, St. Paul, Minn., or use the Request Card at page 18. Circle No 33.

Scaffolding—a folder showing over 200 different ways to scaffold and shore unusual and routine construction, renovation, and repair projects. Profusely illustrated with on-the-job photos; includes details as to how, where, and by whom the work was accomplished.

Write to The Patent Scaffolding Co., Inc., Dept. C&E, 38–21 12th St., Long Island City 1, N. Y., or use the Request Card at page 18. Circle No. 57.

Structural aluminum—the revised "Alcoa Structural Handbook." Revisions include changes in text, general updating of tables, and the addition of several new tables. Also offers extensive data on the aluminum-magnesium alloys and comprehensive coverage of welded-structure design.

Write to the Aluminum Co. of America, Dept. C&E, 789 Alcoa Bldg., Pittsburgh 19, Pa., or use the Request Card at page 18. Circle No. 81.

Dump trailers—a job-study folder detailing performance features of Galion tandem-axle, lightweight, 26-foot, 15-cubic-yard-capacity frame-type dump trailers. Hauling, dumping, and stockpiling operations outlined. Folder JS-2.

Write to the Galion Allsteel Body Co., Dept. C&E, Galion, Ohio, or use the Request Card at page 18. Circle No. 6.

Motor graders—a brochure describing the L-W line of motor graders ranging from 67 to 190 horsepower. Generously illustrated with photographs and diagrams. Form No. MG-155.

Write to the LeTourneau-Westinghouse Co., Dept. C&E, 2301 N. E. Adams St., Peoria, Ill., or use the Request Card at page 18. Circle No. 73.

MOBILE OFFICE Units are low in cost . . . Built to your specifications . . . There's a unit to fill your every need.

Because MOBILE OFFICE Units are easy to move from job to job, they enable you to have office, engineering, paymaster and other facilities at every point of your operation.

These units are economical, time saving, rugged and durable. They are self-containing, and are available with air-conditioning, and can be fitted to your specifications.

MOBILE OFFICES are being used by major contractors and other major businesses throughout the United States. In every case they have proven their worth.

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A Recording Speedometer that provides a "trip resume"
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Alarm when pre-adjusted speed is reached.

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Electrically registers hours and minutes of engine operation. For use on materials handling equipment, tractors, road graders, trucks, pumps, etc.

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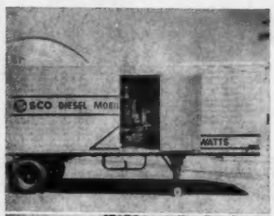
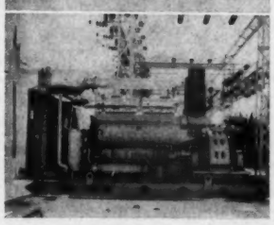


750 kw Portable Power Plant



300 kw Power Plant on Wheels

300 KW TO 1000 KW CAPACITY

IMMEDIATE DELIVERY
READY TO OPERATE
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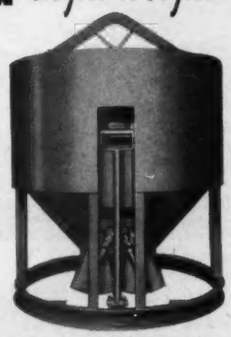
For more facts, circle No. 395

NEW! JOHNSON® light-weight CONCRETE BUCKETS

SIZES:	NET WEIGHT*
½ cu. yd.	355 lbs.
¾ cu. yd.	455 lbs.
1 cu. yd.	700 lbs.
1½ cu. yd.	840 lbs.
2 cu. yd.	1075 lbs.

*approx.



Light in weight, low in cost, this all-new series of concrete buckets from Johnson gives high ratio of capacity-to-weight. Makes each pour more profitable for you! Features: all-welded steel hopper, frame. All working parts above discharge point and well within bucket outline—protected during work, storage, shipment. 50° slope of cone bottom gives complete discharge of medium-slump concrete. Short-stroke, easy leverage handle. Double-clam gates. Stainless steel shafts in nylon bearings. Write today!

— — — Mail to C. S. JOHNSON CO., Champaign, Ill.— — —

Send more information on ____ cu. yd. light-weight concrete bucket

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COMPANY _____

STREET _____ J910 C&E

CITY, STATE _____

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For more facts, use coupon or circle No. 396

Calcium chloride—a pamphlet on how to prepare standard calcium-chloride solution, prepared especially for ready-mix concrete producers. Contains illustrated recommendations for procedure in making solution and a chart on recommended gallons of solution per batch. Includes information on automatic dispensers.

Write to the Calcium Chloride Institute, Dept. C&E, 909 Ring Bldg., Washington 6, D. C., or use the Request Card at page 18. Circle No. 78.

Concrete tamper—a booklet describing the Jitterbug Crawler, a manually operated concrete tamper said to reduce labor and speed concrete finishing time. Photographs, drawings illustrate text.

Write to the Goldblatt Tool Co., Dept. C&E, 1910 Walnut St., Kansas City 41, Mo., or use the Request Card at page 18. Circle No. 54.

Tractor shovel—a specification bulletin on the Trojan Model 204 tractor shovel. Emphasizes the three interchangeable buckets, which give the machine a carrying capacity of from 1½ to 2¾ yards. Information on optional equipment.

Write to The Yale & Towne Mfg. Co., Trojan Division, Dept. C&E, Clinton St., Batavia, N. Y., or use the Request Card at page 18. Circle No. 115.

Equipment installment financing—literature on the National Acceptance Co. of Chicago plan for financing the sale or leasing of construction machinery, equipment, and fixtures.

Write to the National Acceptance Co. of Chicago, Dept. C&E, First National Bank Bldg., 33 S. Clark St., Chicago 3, Ill., or use the Request Card at page 18. Circle No. 21.

Truck-mounted crane—a catalog containing over 40 machinery and assembly photos of the newest Bay City CraneMobile.

Write to Bay City Shovels, Inc., Dept. C&E, 2611 Center Ave., Bay City, Mich., or use the Request Card at page 18. Circle No. 124.

Crushers—a bulletin on Telsmith Gyrasphere secondary crushers. According to the literature, these units are designed especially for coarse and fine crushing, and are made in 24, 36, 48, and 66-inch sizes. Bulletin No. 274.

Write to the Smith Engineering Works, Dept. C&E, P. O. Box 723, Milwaukee, Wis., or use the Request Card at page 18. Circle No. 118.

Water heaters—literature on Aeroil self-contained portable coil-type hot-water plants for all operations requiring as much as 1,600 gph with a temperature rise of 50 degrees F. Photographs, drawings, specifications. Leaflet HE-W-1.

Write to the Aeroil Products Co., Inc., Dept. C&E, 75 Wesley St., South Hackensack, N. J., or use the Request Card at page 18. Circle No. 60.

Truck equipment—a comprehensive catalog describing Hercules truck equipment including hoists, dump bodies, and dump trailers. Generously illustrated with photographs and drawings. Includes hoist-selection and body-capacity charts.

Write to the Hercules Steel Products Co., Dept. C&E, Galion, Ohio, or use the Request Card at page 18. Circle No. 46.

Pin puller—a folder describing the design and operating characteristics of the Pemco hydraulic pin puller. Simplicity of operation and high-speed one-man performance are stressed as outstanding features. Illustrated with photographs.

Write to Pemco, Inc., Dept. C&E, 7 N. Roselle Road, Roselle, Ill., or use the card at page 18. Circle No. 80.

Scaffolding—literature on the Beaver - Advance scaffolding line. Special emphasis on the firm's panel and brace locking mechanisms. Numerous on - the - job photographs. Specifications data, safety rules included. Catalog No. 62.

Write to the Beaver-Advance Corp., Dept. C&E, P. O. Box 792, Ellwood City, Pa., or use the Request Card at page 18. Circle No. 15.

To obtain the literature described on this page, write to the manufacturer or circle the designated number on the Request Card at page 18.

Cements—a catalog on the uses and applications of Atlas portland cements in building construction and products manufactured. Profusely illustrated with drawings, photographs.

Write to the Universal Atlas Cement Division, United States Steel Corp., Dept. C&E, 100 Park Ave., New York 17, N. Y., or use the Request Card at page 18. Circle No. 70.

Crane-excavator—a bulletin covering the Schield Bantam Model CR-350 self-propelled 11-ton crane-excavator. Also describes and illustrates the complete line of front-end attachments. Bulletin CR-350.

Write to the Schield Bantam Co., Dept. C&E, 219 Park St., Waverly, Iowa, or use the Request Card at page 18. Circle No. 114.

Tilt-up mixers—a bulletin on Rex tilt-up mixers. Presents complete information on mixers for ready-mix plants, Porto-Plants, and central-mix paving. Illustrates installation, design, and mixing benefits. Bulletin No. 59209.

Write to the Chain Belt Co., Dept. C&E, 4701 W. Greenfield Ave., Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 34.

Manual hoist puller—literature describing the construction applications of Power-Pull, a manual hoist puller that enables one man to handle up to a 1½-ton load. Text and photographs stress the heavy-duty design.

Write to the American Gage & Machine Co., Dept. 86A, Dept. C&E, 125 Bayard St., Dayton 1, Ohio, or use the Request Card at page 18. Circle No. 131.

Crane-excavator—a bulletin illustrating and describing the Koehring 545 Sprawler, a crane-excavator able to lift more than its own weight. Emphasizes versatility, easy transportability. Photographs and drawings. Bulletin K-616.

Write to the Koehring Co., Dept. C&E, 3026 W. Concordia Ave., Milwaukee 16, Wis., or use the Request Card at page 18. Circle No. 102.

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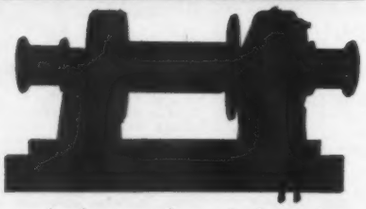
With oil field equipment getting larger and heavier the need for larger trucks becomes imperative. Two mammoth Mack trucks, with special rig-up by the Export Division of Hobbs Trailers — mounted by Dan Mitchell and Sons, Inc. of Corona, N. Y., is an example of the way transportation equipment manufacturers are filling this need.

Both of these trucks, now in use in Argentina, are equipped with a standard BRADEN MS50-20B winch. This BRADEN Winch was selected because of its ruggedness, and patented safety features that keep extremely heavy loads under perfect control.

The BRADEN MS50-20B weighs 1,786 lbs. and is 63" long from capstan to capstan. It has a safe rated capacity of 100,000 lbs.



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Schuster Construction Co., Green Bay, Wisc., cuts costs with a Dotmar, paving median strip curbing on U.S. 41 near Neenah, Wisc. at better than 300 ft. per hour. Machine does not hold up ready-mix trucks. Makes curb or gutter of any shape—sidewalks too, highway median strips and city street widening with curb to 6 ft. wide.

M. G. Monte Contracting Co., Mt. Clemens, Mich., keeps ahead of schedule paving curb and gutter on Detroit Expressways and State Highway projects. Dotmars quickly return their cost.

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L-W forms department; names sales managers

D. K. Heiple has been named manager of the newly formed sales-development department for LeTourneau-Westinghouse Co., Peoria, Ill. In his new post, he will continue to have charge of field-engineering activities and will be responsible for the company's marketing-research and sales-engineering programs.

J. E. Sheets has been named Eastern sales manager, succeeding D. H. Mitchell, who resigned.

Ralph E. Prohaska has been appointed manager of the Washington, D. C., government sales office for L-W. He will be in charge of all government sales for the East Coast states. Prohaska succeeds Sheets.

South Bend Division names district manager

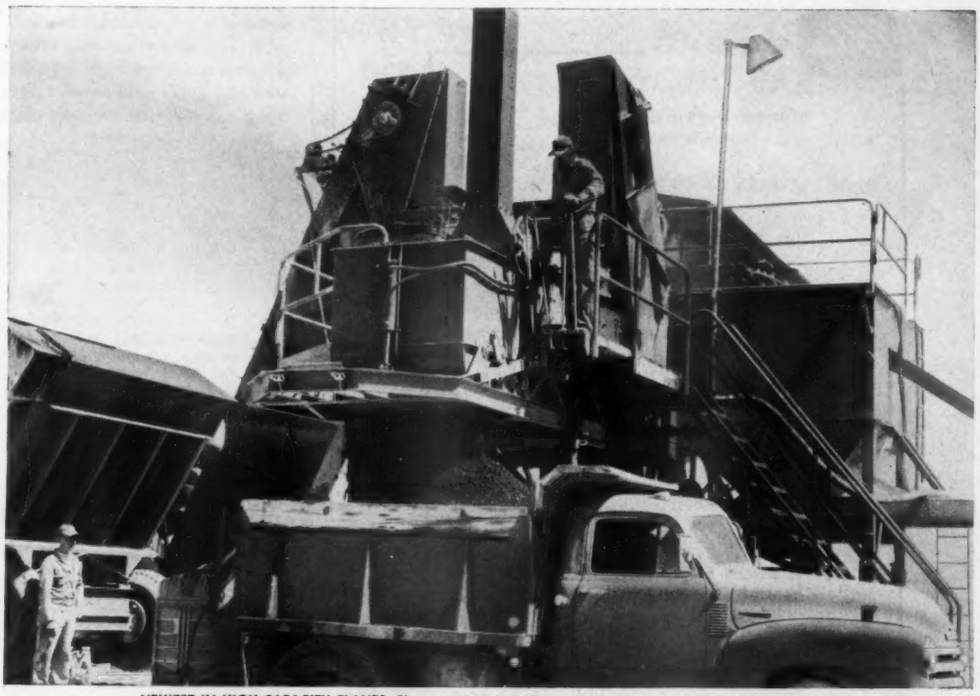
Claude E. Osborne has been appointed the southern district sales manager for the South Bend Division, Curtiss-Wright Corp., South Bend, Ind. He will head up sales of construction machinery made by the division, in Alabama, Louisiana, Mississippi, and Arkansas.

LeTourneau personnel

Sian Fain has been appointed manager of advertising and sales promotion for R. G. LeTourneau, Inc., heavy-equipment firm of Longview, Texas. He will head the advertising and sales promotion department and will direct the company's marketing activities at D'Arcy Advertising Co., handled through that agency's offices in Houston.

As of the first of this month, the five-cent increase in the federal gas tax will be in effect.

A NEWLY DESIGNED V-TYPE BLADE for working under tough rock conditions and a rear-mounted Ateco ripper are used on an International TD-24 crawler for road grading by the L. K. Hollenbeak Logging Co., Hayfork, Calif. The company is building seven miles of new truck haul roads and improving another seven miles of inadequate county roads to provide access to 14 million board-feet of timber for the Trinity Alps Lumber Co.



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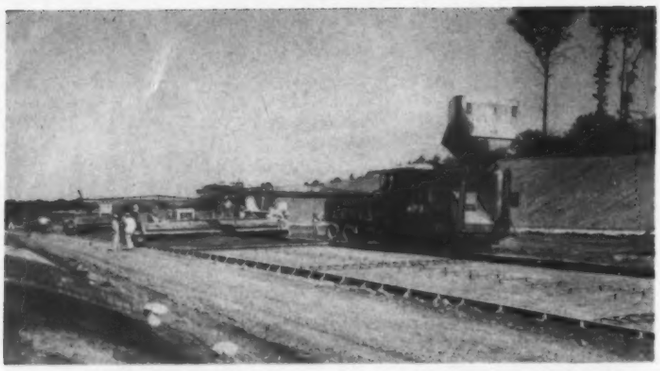


A pair of Rex 34-E pavers, working from one side of the forms, sets the pace for the fast concrete paving spread working on a section of the Baltimore Beltway in Maryland. The concrete dumped by the first paver is struck off to a 7-inch depth so that wire reinforcing can be placed.

Efficient spread paves new beltway

A fast and completely mechanized paving spread, with two Rex 34-E double-drum pavers in the lead, made fast work of a section of Baltimore Beltway between the Patapsco River and Wilkens Avenue near southwest Baltimore.

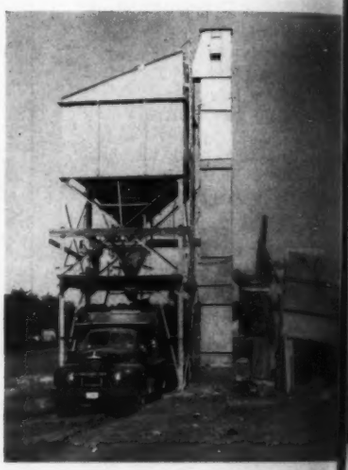
C. J. Langenfelder & Son, Inc., Baltimore, contractor on the $2,965,-459 project, paved the 2.72 miles of dual 24-foot roadways with the Rex 34-E's riding along the same side of the 24-foot-wide roadway being constructed. Each paver dumped its batches in front of a Blaw-Knox spreader. The first spreader trimmed the mix to a 7-inch thickness so that wire-mesh reinforcing could be placed 2 inches below the surface of the 9-inch slab. Since both pavers operated along one side, and the crew placing the wire reinforcing worked along the opposite side, men and machines did not interfere with each other along the pavement being laid.

Two Blaw-Knox double-screed transverse finishers followed the second spreader to smooth the slab surface. A Koehring longitudinal floating machine followed, removing the transverse ridges left by the finishers.

The hand-finishing crew, using two burlap drags and two aluminum hand lutes, then gave the slab surface the desired texture.

Curing and sawing

Curing paper was used to cover the freshly poured slab. The Blaw-Knox 9-inch forms were stripped the following day. Langenfelder had about 5,000 linear feet of forms on the job.



Batch trucks pick up cement at the drive-through-type Blaw-Knox 1,200-barrel cement bin. Delivery of cement is made by trucks, which dump into the hopper, right, that feeds the screw conveyor and the bucket elevator.

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By CHARLES H. THOMPSON, *Oklahoma State University.* Discusses and illustrates valves and fittings in enough detail to give an understanding of working principles and applications. Includes a section on the language of piping. *1958. 66 pages. $3.50*

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and always kept forms set more than 500 feet ahead of the pavers.

Forms were set by driving the pins with an air hammer powered by a Gardner-Denver 60-cubic-foot compressor. When forms were stripped, pins were pulled by a hand pin puller and the forms loaded onto a Rodgers trailer pulled by a Mack tractor.

Three portable Clipper saws cut the transverse and longitudinal joints in the roadways. All joints were cut to depths of 2½ inches between 8 to 20 hours after concrete was put down. A week later, they were filled by a Clipper heater and hand nozzle.

Preparing grade

The contractor used a Blaw-Knox subgrader to shape the grade ahead of the pavers. The grade was then finished with a Buckeye Finegrader and compacted by a Buffalo-Springfield 3-wheel 5-ton roller pulling a Cleveland Trailgrader. A Cleveland scratch template then followed to check the finished grade between the forms.

Batch plant

Langenfelder had a Blaw-Knox 105-ton 3-compartment aggregate bin, fed by a Lorain crane, to charge the two sizes of stone and the sand to the batch trucks. Stockpiles of Maryland No. 6 and No. 2 stone, plus the sand, were maintained adjacent to the aggregate bin.

Cement, delivered from a railroad siding by trucks, was stored in a Blaw-Knox 1,200-barrel drive-through-type bin at the batch plant. Trucks dumped the cement into a hopper feeding a screw conveyor that transferred the cement to the enclosed bucket elevator.

Personnel

Snap Brady was the job superintendent for Langenfelder, and E. Kirkchism was the project engineer for the Maryland State Roads Commission. THE END

The second Blaw-Knox spreader in the lineup spreads the mix to the full 9-inch depth of the slab. Two B-K double-screed transverse finishers and a Koehring longitudinal float follow.

The Blaw-Knox 105-ton 3-compartment bin is charged with aggregate by a Lorain crane. Batch trucks, with a 3-batch capacity, are being charged with stone and sand before they pick up cement.

26-39

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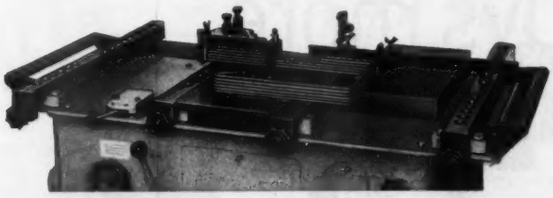

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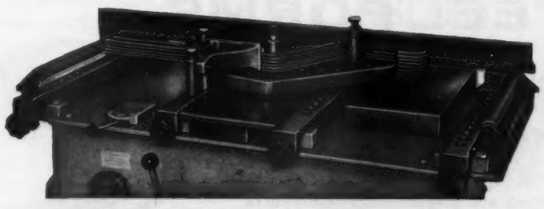

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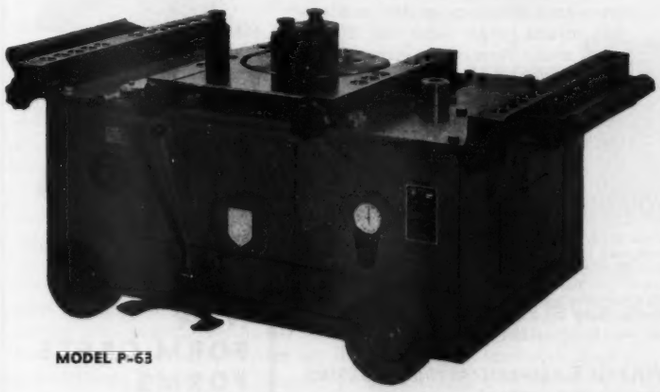

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Management

Inspection Department: Fabricated materials

by GEORGE E. DEATHERAGE, P. E.
construction consultant

This is the forty-seventh of a series of articles on Construction Management by George E. Deatherage, P. E., consultant to National Schools of Construction Management, P. O. Box 510, Weiser, Idaho, and P. O. Box 8415, Charlotte, N. C. The articles are based on an eight-volume "Manual of Advanced Construction Management" published by the National Schools.

Inspection requirements for fabricated materials range from thorough to cursory. The thoroughness of inspection of structural-steel fabrication, for instance, depends on whether the material is going into a simple one-story structure or a 50-story skyscraper. Steel for the small building might be accepted without shop inspection or when it is supported by affidavits from the fabricator that the steel, as fabricated, meets the requirements of the American Institute of Steel Construction.

On more important work, sound engineering judgment may require that steel be inspected for proper materials, fabrication within allowed tolerance, proper welding, and riveting. In these cases, the contractor may supply his own inspector or have the work done by an independent inspection agency. This is usually charged for on a per-ton basis.

It is most important that a fabricated assembly meet all the load-carrying or pressure requirements. This becomes important in the fabrication of pressure vessels, tanks, and other storage enclosures. Although the specifications may definitely require inspection before the fabricated assembly is shipped, many manufacturers will overlook this.

It is a good practice for the confirming purchase order to bear a formal notification such as this: "We will require shop inspection of the equipment and materials covered by this order before it is shipped to us. Please notify us at least 10 days previous to the date you will require such inspection. Shipment must not be made until you have received a Certificate of Inspection and Acceptance, signed by our inspectors."

If the fabrication does not require extensive inspection, the certificate of inspection may be forwarded to the manufacturer for him to comply with and attest with his signature. Obviously, this can be done only with reliable firms.

Site inspection

On work subject to the architect's or engineer's inspection, the general scope of such inspection will usually be covered in the general conditions of the contract or in the specifications. Many architects and engineers have resident inspectors, similar to those on work being done for municipal, state, and federal agencies.

The work of the resident inspector is to see that the work is done in accordance with the plans and specifications and that materials used and workmanship meet rigid standards.

Excavation inspection

When a project calls for excavation, it is necessary to check for proper layout and excavation to proper line and grade, as well as to make sure that bottomed areas are in ground capable of supporting design loads. The inspector should be familiar enough with the bearing values of various types of ground to know when further examination and load tests are required.

The required pumping and bailing facilities should of course be provided

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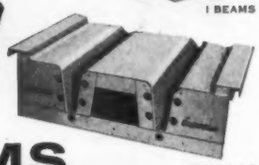
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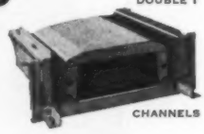
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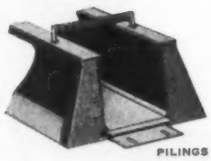
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to keep the excavation free of water, particularly before the placing of forms, reinforcing, and concrete. Sheeting and bracing should be inspected for adequacy and for safety. A great many building codes state minimum requirements for this item.

The superintendent must make certain that layout work is correct, and he must provide for checking and recording the driving of each pile, using the specified formula. If it is necessary to load-test a pile during construction, a test platform may be adapted to the work.

Wooden piles must be inspected for length, size at the butt and top, soundness of the timber, variety of wood, etc. These items will no doubt be covered by the specifications for the work. Such inspection should be carried out well ahead of the driving schedule so that replacements may be secured for condemned piles.

If concrete piles are poured in place, the driving of the shell mandrel will need to be checked, blow by blow, and the interior of the completed shell inspected as well as materials that fill the shell.

Precast piles must be inspected previous to driving to assure sound construction and lack of damage. The pile inspectors should be cautioned against overdriving this type of pile; overdriving may subject the pile to considerable damage. Overdriving is also something that must be watched in driving wood piles; more piles are made useless by overdriving than underdriving.

Inspecting concrete materials

Cement of recognized brands will be accepted on the basis of manufacturer's certified mill test in accordance with ASTM C9–26.

The job superintendent forwards a 15-pound sample of sand and a 30-pound sample of coarse aggregate to the main office for testing. Small quantities of each are filed for reference, properly identified as to source. The remainder is turned over to the testing laboratory for analysis.

Sand is given tests, such as those for fineness modulus, percentage of silt and other coatings, organic contamination, weight per cubic foot—dry loose and dry rodded, and a 7 and 28-day mortar-strength comparison with standard Ottawa sand. Coarse aggregate is tested for fineness modulus, weight per cubic foot—dry loose and dry rodded, specific gravity, percentage of voids, and durability.

In special cases, coarse aggregate of questionable durability will be subjected to the sodium-sulphate-solution test for soundness. The testing laboratory submits a report covering each aggregate tested and gives an opinion as to its suitability for use in concrete work. Where a number of aggregates are submitted for analysis during the course of the work, the inspector prepares a summary sheet tabulating the essential characteristics of each aggregate.

The inspector notes the method of handling and storing cement with respect to protection from weather and dampness. Consideration should always be given to the possibility of the aggregates becoming contaminated and segregated.

Steel

Billet and rail steel from reliable sources is accepted on the basis of the manufacturer's statement of analysis and physical proportion in accordance with ASTM A15–14 or A16–14. The inspector examines steel for mill scale, flaking rust, grease, or other coatings detrimental to bond. Bends of typical bars should be checked for accuracy and uniformity, as well as the diameter of cold bends, and particularly hooks and bends over 90 degrees. Spacing and clearance with respect to finished surface of concrete and position of reinforcement in the forms must also be checked.

In the case of beam and slab forms, the inspector checks such dimensions as thickness, column diameter, alignment, plumb, and camber, as well as the general construction, preparation for concrete, and removal of forms.

The inspector determines the amount of water per sack of cement, including the mixing water delivered

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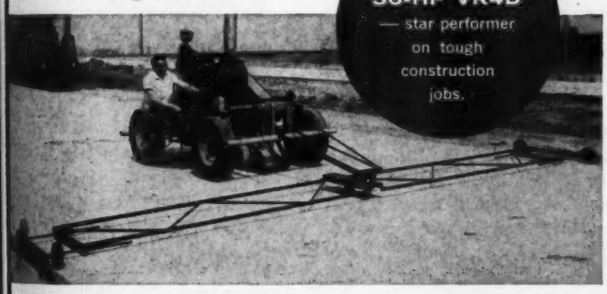
RUGGED 56-HP VR4D — star performer on tough construction jobs.



New 56-hp **WISCONSIN-POWERED** saw cuts concrete and costs—automatically!

Powered by a 56-hp Wisconsin air-cooled VR4D engine, the C-560 is the most powerful longitudinal concrete saw ever to hit the pikes and airports. Built by Clipper Mfg. Co., of Kansas City, Mo., the C-560 speeds up and mechanizes sawing of control joints.

The new Clipper saw cuts fast and true without lead-off or center-line layout. And once started, *it keeps on sawing unattended* — even around curves — leaving the operator free to flush off slabs, and do other related jobs.

The rugged VR4D Wisconsin engine provides power to spare for running two blades at the same time. Faster cutting speed keeps jobs on schedule and extends service life of blades. The VR4D also propels the C-560 at speeds up to 35 fpm — forward and reverse.

Stepped-up power, say Clipper engineers, doubles cutting speed and sawing production — uses 19% less gas. The VR4D also provides all-weather dependability and gives the most hp-hours of service with the least amount of care.

Take a tip from Clipper—specify the 56-hp Wisconsin VR4D air-cooled engine for your heavy-duty high-power jobs. Write for Bulletin S-230.

WISCONSIN MOTOR CORPORATION
MILWAUKEE 46, WISCONSIN
World's Largest Builders of Heavy-Duty Air-Cooled Engines

AS-6249

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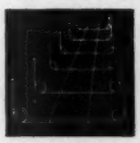
SYLGAB
STEEL and WIRE ACCESSORIES for Fast FIREPROOFING of Structural Steel



RIGID BEAM CLIP
5′ lengths — installed with lightning speed. Made of #12 or #10 gauge galvanized.

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for beams over 16" deep. Made of #10 or #12 gauge galvanized wire.

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TOGGLE HANGERS
More rigid than any wire. Used in conjunction with SYLGAB SNAP-ON HAIRPIN CLIP *to tie main and cross furring together.*

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FORM SPACERS • BAR ACCESSORIES
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For more facts, circle No. 407

Construction Camera

Backfilling a 6-inch gas line at the Royal Meadow subdivision area of Rochester, N. Y., is a Model HU Payloader tractor shovel equipped with an angle blade. The rig is also used to lower in and move the 1,300 linear feet of pipeline, which is being built for the Rochester Gas & Electric Co.

Reclaimed land at Big Coppett Key, 8 miles northeast of Key West, Fla., will be the site of a 60-acre development for residential housing and a trailer park. Contractor Charlie Toppino & Sons, Key West, is using International Model 65 Payhaulers to handle fill material.

Perma-Vane rotor blades make the DAVEY Hydrovane Rotary 125 today's best compressor investment!

HYDROVANE DAVEY KENT OHIO U.S.A.

Davey 125 on Ohio Fuel Gas Co. job, Galena, Ohio.

Tired of blade troubles?

Then, make your next compressor a Davey!

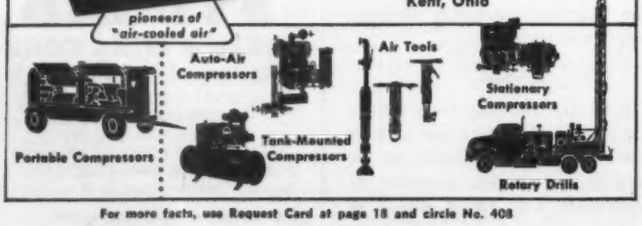
For, Davey's new Perma-Vane blades have greater wear resistance . . . are free from deterioration and breakage . . . eliminate the biggest single source of rotary compressor trouble . . . last longer. Because they're lightweight and "friction-free", Perma-Vanes also require less engine power, reduce fuel costs.

Remember, too, Davey Hydrovane Rotary Compressors are completely free from complicated pipes, pulleys, tubing or plumbing. They actually have 50% fewer working parts than most other rotary compressors . . . are easy to maintain and service! A-3318A

See your Davey distributor today. Write for Bulletin.

DAVEY pioneers of "air-cooled air"

DAVEY COMPRESSOR CO. Kent, Ohio



For more facts, use Request Card at page 18 and circle No. 408

(Continued from preceding page)

to the drum and the moisture contained in the fine and coarse aggregate. Consistency is determined by the standard slump test; the proportion of coarse and fine aggregate to cement is determined by measured receptacles.

The average mixing time for at least five batches must be set. The method of handling concrete to place of deposit, slope of chute, separation of aggregate, and elapsed time between mixing and placing must be noted. Also noted must be the method of deposit, thoroughness of spading and tamping, construction joints, anchor bolts, inserts, placing, cold-weather precautions, hot-weather precautions, and protection of finished concrete.

Concrete specimens

Test specimens of all concrete are taken by the job superintendent at intervals throughout the work. Preliminary specimens of mixes proposed for use are made sufficiently in advance of placing to permit 7-day tests to be made. The inspector checks the making and storing of test specimens in accordance with ASTM C31–27. Particular care should be taken in packing test cylinders for shipment.

Test specimens are taken in groups of three in all cases. The cylinders of each group are made from three consecutive batches of concrete. The location of pour, water-cement ratio, slump, nature of aggregate, mix, and other pertinent data for each group are recorded by the job superintendent on a standard form provided for the purpose.

The total number of test cylinders required will be determined by the inspector, subject to the chief engineer's approval. The intention is to secure a complete check of all concrete poured. All test cylinders are forwarded to an accredited testing laboratory and tested to failure in accordance with ASTM C39–27. One cylinder of each group will be tested at 7 days, the remaining two at 28 days. The inspector maintains a complete record of all test results to date.

The purpose of test cards is to insure that all work in the field is satisfactory and in accordance with the plans and specifications before it is covered up by other trades or accepted as complete. As the job progresses, a card is made out for each subdivision of the work, and as each trade completes its work, both the foreman and inspector sign to this effect.

If, for instance, concrete floors are being built, the carpenter foreman signs that his work is ready in accordance with plans and specifications, and the inspector attests to this fact by signing opposite. The reinforcing foreman attests that all steel is okay, the electrical foreman that his conduit is in, and the pipefitter that the drains and sumps are complete, etc. At each step, the inspectors go over the work, then sign opposite the foreman.

If all work is complete, and concrete is ready to be placed, the chief inspector writes "Ok to place" on the stub and hands it to the general foreman in charge of concrete operations. This process may be followed for any construction operation. Before an insulator or painter can cover up any work, he must have the stub of the approved card. The main part of the card is part of the chief inspector's records, or it may be forwarded to the owner.

Structural steel

A general requirement for structural steel is that it be erected true and plumb, with temporary bracing provided to support loads to which the structure may be subjected, including those imposed by erection equipment. In the setting or erecting of structural steel, the individual pieces are considered plumb or level when the error does not exceed 1 in 500. Interior columns and columns adjacent to elevator shafts are considered plumb only when the error is not in excess of 1 in 1,000 in the total height of the columns.

Workmanship should be the equal of the best workmanship in modern structural shops. All material should be straight and true. If straightening or flattening is necessary, it should be done by a process or in a manner that will not injure the ma-

A section of U. S. 1, several hundred feet long, disappeared into Hebgen Lake when the Montana earthquake struck just west of Yellowstone Park, bottling 200 campers and tourists between the big slide area and the broken road. Naranche & Kenda Construction Co., Butte, Mont., which was grading U. S. 191, was called on at 5 a.m. for help, and it rushed equipment to the area to open an emergency road. By 7:30 p.m., almost two miles of road had been opened for 50 carloads of survivors. These Cat scraper and D8's were part of the fleet repairing 8 miles of road and restoring bridge approaches.

terial. Sharp kinks or bends are cause for rejection.

Structural members should not be cut, notched, or pierced for the clearance of pipes, conduits, wires, and ducts in such a way as to impair their strength, unless provision for this has been made in the design.

Holes for rivets, rivet bolts, and unfinished bolts should not be more than 1/16 inch larger than the nominal diameter of the rivet or bolt. Holes for turned bolts should not be more than 1/32 inch larger than the external diameter of the bolt. All drilling or reaming for turned bolts should be done after the parts to be connected are assembled. Holes that must be enlarged to admit rivets should be reamed. Poor matching of holes is a cause for rejection.

Whenever rolled sections are heated, they should be thoroughly annealed. Compression joints depending on contact bearing should have the surfaces truly machined to a common plane after the members are riveted or welded. All other joints should be cut straight.

(Continued on next page)

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Put these cost-cutting Rivinius "twins" to work for you NOW at this new, amazingly low price! Less operator fatigue . . . less job time . . . better job quality mean more profit dollars from every job. Check these Rivinius features —

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for fast, accurate control from inside cab

- Fits any "Cat" 'grader with sliding moldboard
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for easy wheel-turning, even when standing still

- Fits any "Cat" 'grader
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- Easy to install . . . trouble-free design . . . few moving parts
- Holds grader from drifting — even on inclines
- Frees operator's hands for handling blade and other controls
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Rivinius, inc. EUREKA, ILLINOIS

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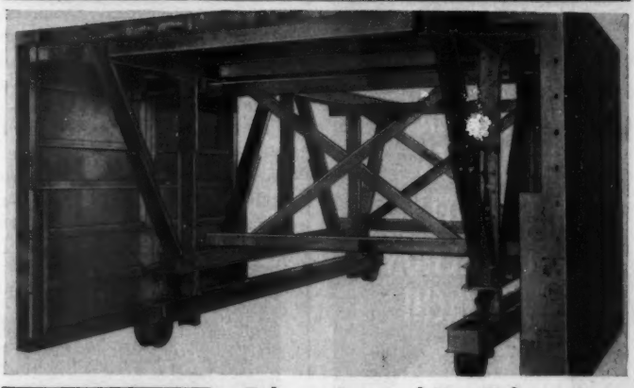

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Construction Camera

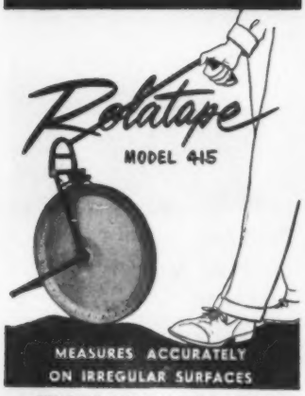
On the way from England to the Persian Gulf—a 7,000-mile tow—are two working platforms for a 1,200-foot-long petroleum terminal off Iraq. The forward section carries a crane for pile driving; the rear section supports 3-story air-conditioned quarters. Raymond International (U. K.), Ltd., is sponsor of the joint-venture.

Nearly 1,000 cubic yards of concrete is being spread and finished per day for the 12-inch-thick, 20-foot-wide lanes of taxi and parking areas at the Malton Airport near Toronto, Ont., Canada, by this Blaw-Knox spreader-finisher. The rubber-tire wheels lower for tow travel.

It's New!

NOW—AT LAST A MEASURING WHEEL THAT MEASURES ACCURATELY TO A FRACTION OF AN INCH!

Rolatape's amazing new Model 415 meets all your measuring needs — measuring quickly and surely over the most uneven and irregular terrain with no risk of human error. This time-saving instrument is calibrated to measure accurately in full view of operator as it is rolled along, giving measurements in inches (to ½ inch) on one side of measuring wheel, and tenths of a foot (to .5 of a foot) on the other. Sturdy and lightweight, it is equipped with automatic brake and built-in stand. Handle folds compactly. See one at your dealer's today.



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(Continued from preceding page)

Fabricated metal members should be true to line and free from twists, bends, and open joints. Compression members should not have a lateral variation greater than 1/1,000 of the axial length between points that are to be laterally supported.

All rivets should be individually inspected for tightness and be free of movement or chatter when struck with a light hammer blow. Such movement or chatter can be detected by holding the fingers of the left hand against the rivet head when the rivet is struck on the opposite side. A little practice will enable the inspector to detect even a very slight looseness in a rivet. Loose rivets should be cut out and replaced with sound ones; there should be no calking of the head against the steel to create the impression of soundness. Rivets should fill the holes completely, the heads full and axially in line with the rivet shank. Much rivet trouble is caused by rivets of improper length, particularly short rivets that do not provide sufficient stock to fill the holes and make a full head. Overheated and burned rivets should be removed. These may be detected by a burned color and pitting of the head.

In most localities, welders on structural work must be qualified and carry identification to that effect. Usually qualification requirements follow the requirements of "Standard Qualification Procedure, Section 1, Manual Arc and Gas Welding" of the American Welding Society. Every weld connection or structure should be stamped or marked so that the welding operator for each weld and the inspection company or agency may be readily identified. Deficient welds should be removed by chipping. Detailed specifications for both riveted and welded work may be secured from the Steel Construction Manual, American Institute of Steel Construction, 101 Park Ave., New York, N. Y.

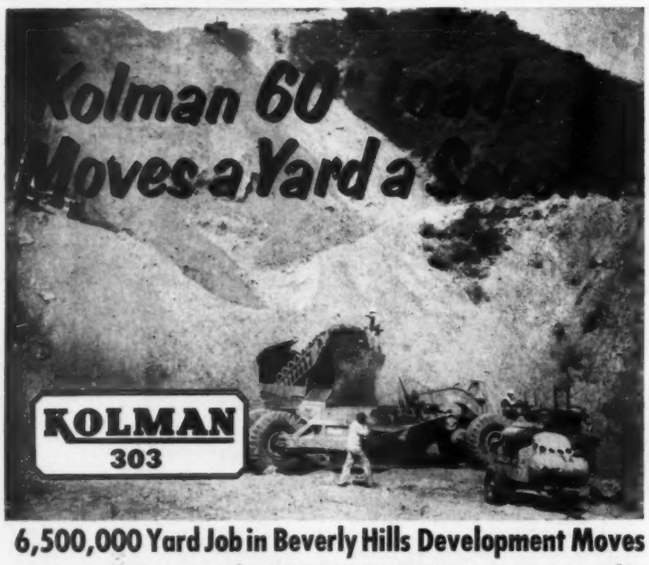
Building inspection

Building work must meet existing building codes in the locality. These codes are not expensive; copies should be in the files of every superintendent.

Generally, a superintendent will be employed on one general class of work, and it is not a difficult matter for him to secure copies of codes and standard specifications, from manufacturers and others, which bear on the work he is doing. Once he has the information on the materials to be used and how they are installed, the inspection boils down to seeing that the work conforms to requirements.

Heavy construction

Specifications for both materials and workmanship are more detailed for heavy construction, for each project is specially designed. Practically all of the design is done by experienced engineers. These projects are large and costly, and definite and explicit specifications work for economy where large volumes of a commodity are used. The superintendent on a heavy-construction job



6,500,000 Yard Job in Beverly Hills Development Moves at Record Pace with KOLMAN 303 Conveyor-Loader

Cutting down high ridges and filling in canyons to construct homesites in an exclusive movie colony residential district in Beverly Hills involved moving 6,500,000 yards of rocky decomposed granite for J. A. Thompson Company, Los Angeles. The job was started with a fleet of scrapers which had to travel a mile over steep grades. The Kolman Model 303 belt loader 60" wide and 50' long was installed at the base of the high ridges. Dozers pushed material downhill to the feeder-trap, 29 feet in length, which allowed a huge live surge pile at the feed end of the unit.

Rubber tired scrapers having a capacity of over 20 yards were loaded in 17 to 18 seconds. The Kolman 303 eliminated 75% of the scrapers and tractors called for in the original estimate. The Thompson Company figures it saved the cost of the loader on scraper tires alone!

The KOLMAN 303 Belt Loader is available with wheels and tires or as a skid-mounted unit. Extra heavy duty construction throughout delivers top performance under even the most severe loads.

Kolman Portable 303 Loader. Also available as a skid-mounted unit.

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4922 W. 12th St., Sioux Falls, S. D.

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Drills chew into rock during foundation work for the main generating plant of the Niagara Power Project. Merritt-Chapman & Scott Corp., New York City, contractor on the project, is using 4 and 4½-inch Brunner & Lay carbide Rok-Bits with the large drills and 3-inch 700 Rok-Bits on the crawler drills.

Ledge rock is loaded out by a Lorain 85A at the site of the Hodges Village flood-control dam at Oxford, Mass. Rock cuts for spillway and diversion channels are up to 2,500 feet long, 60 feet wide, and 40 feet deep on this U. S. Army Corps of Engineers project.

is not forced to rely on his own judgment as to what constitutes proper materials and workmanship. He can afford to provide the personnel and facilities for a very thorough inspection.

Highway inspection comes under the jurisdiction of city, county, or state highway inspectors or engineers. Specifications on this class of work are quite explicit, and the class of workmanship required is covered in the general specifications. The main duty of the superintendent or project manager is to see that all requirements are met and that proper written evidence is maintained.

Inspection of asphalt or bituminous highways, in contrast to those of concrete, is quite complex because of the nature of the various mixes used and the fact that the wearing surface is made up of several layers of different materials.

Details on the standard types of bituminous roads and streets are available from asphalt producers and The Asphalt Institute, University of Maryland, College Park, Md.

In essence, good inspection requires good tools, both in the laboratory and in the field, and familiarity with and ability to make and interpret an analysis.

(Next month's article will deal with "Safety Department: General functions.")

General Tire promotes; erects tire plant

Floyd A. Yocke has been promoted to manager of the Akron division of The General Tire & Rubber Co., Akron, Ohio. He will direct tire sales in areas of Ohio and West Virginia and part of Pennsylvania. Yocke replaces William M. Hempel, who has been promoted to another assignment.

Construction has begun on a $9,000,000 plant in Mayfield, Ky. The plant will be the company's third domestic tire factory.

Arthur I. Reilly has been promoted to manager of passenger tire sales for the company's New York division. He was formerly a Newark, N. J., territory salesman for the firm.

William Z. Weems has been promoted to manager of special-purpose tire sales for the Dallas and Houston, Texas, divisions. He will have special responsibilities in the sale of off-the-road giant tires in Texas, New Mexico, Oklahoma, and Louisiana. George E. Bowling has been promoted to a similar post for the Cincinnati and Memphis divisions and will cover the south central United States. In the same capacity, Robert I. Black now serves the Chicago and Twin Cities divisions, covering the north central part of the country.

Others receiving new assignments are Kenneth M. Smith, manager of truck-tire sales for the Akron division; William A. Mullin, manager of camelback and repair-material sales; Floyd A. Yocke, the Akron division manager; and John J. Scialli, manager of the Portland, Ore., tire division. Scialli will direct sales of General tires, tubes, and related products in the Northwest, including Alaska.

Thumbnail reviews of new equipment literautre start on page 146.

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NEWS ABOUT THE DUMP BODY BUSINESS

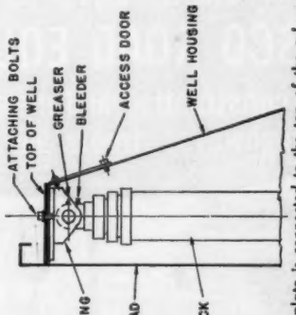
Increase Your Earning Power with MARION'S New Front End Hoist For 8, 9, 10 Foot Bodies

Another rugged and competitively priced Marion hoist is now available in three models for 8, 9 and 10-foot bodies. Outstanding features incorporated in the hoist provide time and performance saving benefits for all users.

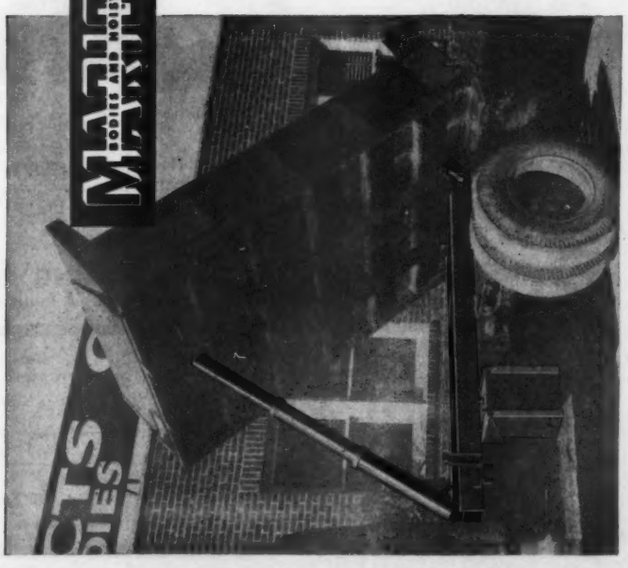
● The method of attaching the cylinder to the body speeds up installation and allows fast, easy detachment for any servicing in the field (see diagram). ● The deep oil reservoir, mounted on the side, provides a quieter, cooler, more efficient hydraulic system and eliminates the danger of drawing air into the system ● Weight savings from 65 to 270 pounds ● Fast dumping speed ● Pump with safety relief valve.

Write for a bulletin covering the three models, F-5131-65-72-82.

MARION METAL PRODUCTS CO.
Marion, Ohio, U.S.A.



The top plate is connected to the top of the cylinder before the body is installed. Then as the body is let down, the cylinder will guide itself into place in the cylinder housing. The body is then secured from the outside at the top by two bolts that fasten the body to the top plate.



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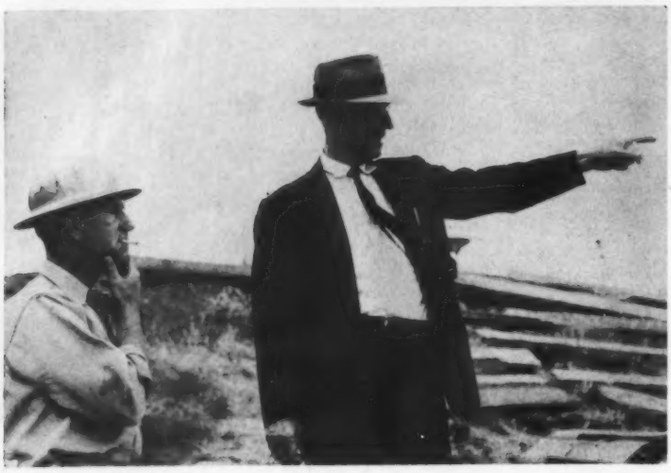

Stan Barber, superintendent of E. E. Barber Construction Co., Fort Smith, Ark., listens to some suggestions from his father, E. E. Barber, president of the company, during work on a $1.4 million bridge crossing of the North Canadian River in Oklahoma City. Stan started in construction when he was 13.

He'll stick with bridge building

Despite the loss of a leg, Stan Barber, 28, is one of the best bridge supers in the business

Stan Barber started working around construction jobs, learning the business, when he was 13. Today, at 28, despite the loss of his left leg as the result of an accident in the field, he's still learning—about construction and about the men who work for him.

Not too long ago, E. E. Barber Construction Co., Fort Smith, Ark., was working on a bridge near West Memphis, Ark., and the force was building a pier per day—about the best production the company had to that date. Stan was pushing the job when blood clots and bad circulation put him in the hospital. When that happened, he figured it was the end of the job.

But the crews were still working for Stan and, with him in the hospital, they went out and bettered their rate of a pier per day. That taught Stan two things. First, if your men like and respect you, they'll do anything for you. Second, no man is indispensable.

Crews of E. E. Barber can get bridges built without Stan, but they'd hate to have to do it. He's one of their best superintendents. At the age of 28, he has about $2 million worth of work on his shoulders. And the more bridges he can build, the happier he is. That's why, after the accident he had when he was 23, and despite the injury and the doctor's advice, he continued the work he loves to do—building bridges.

Ankle pinned to pier

It was a freak accident. Crews were pulling the steel from a detour bridge when an I-beam tipped over and pinned his ankle to the pier. He went to the hospital with a mangled ankle. Gangrene set in, and the doctors had to amputate. Some 15 operations and 11 months later, he left the hospital with his left leg cut off above the knee.

His father, considering the doctor's advice, had a job in the home office waiting for him. Stan had other ideas.

"Look, dad," he said, "I'd rather stand on one leg in the field than sit on my rear in the office."

His father, knowing his son was just as stubborn as he was, said, "Okay, go right ahead."

Several months after Stan got out of the hospital, he had a bridge to build. While he was superintending the job, he learned how to use his artificial leg. His leg, unlike the real

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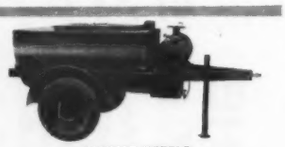

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9-wheel self-propelled . . . torque converter, power brakes and steering.

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9 or 13 wheel roller . . . 90 to 125 cubic feet capacity.

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Two-way . . . power driven . . . full 4-wheel trailer mounted.

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Years of use by satisfied customers prove Rosco machines are built to last . . . built to turn out a top-notch job every time. For full details on the dollar-saving specifications ask for literature on the equipment you need.

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Rugged, Inexpensive VERMEER
POW-R-DITCHERS

If one of your problems is low-cost, time-saving trenching and ditching . . . take a look at the VERMEER POW-R-DITCHER line before you buy! The 524T (above) digs 8" to 24" wide. The 4T (right) digs 6" to 14" wide. Both are fast, rugged, self-propelled and low in price. Ideal for digging foundation footings, gas, water, sewage and service lines. A third smaller unit also available.

Write For Literature and Low Prices On The Complete Line

VERMEER MANUFACTURING COMPANY
1437 W. WASHINGTON PELLA, IOWA

For more facts, use Request Card at page 18 and circle No. 416

Despite the advice of doctors, Stan went back into the field after losing his leg several years ago as the result of an accident. At this point, he's supervising forming of a pier inside a sheet pile cofferdam.

Stan jumps in to lend a hand in placing concrete for the box-shaped stem of a bridge pier. The super, who can run any piece of equipment on the job, believes in never telling a man to do what you can't do yourself.

of him, was designed for office work. It was all right for walking around on a level floor, but it wasn't built for climbing around on a bridge job.

Plenty of falls

During those first months, Stan took a lot of falls. But he kept on working until he was able to get around almost anywhere. He could climb in and out of a cofferdam. He could walk a smooth beam. He could operate—as he had before—any tractor-dozer or crane on the job.

Looking back at the accident, Stan thinks that it actually has had a good effect on his work. "In getting around with this bum leg, I've had to plan each step I take. Now, I plan the moves of the men and equipment more carefully, I spend more time planning the work, and it pays off in a smoother running job.

"And, of course, I keep a sharper eye on my men to see that they work safely. In the last two years, we've had only one lost-time accident."

In his mud-splattered khakis, tin hat roofing his head, Stan Barber runs a job as a quarterback runs a football team. In his firm, unhurried voice, he calls the signals, and then moves quickly with the players.

Works for other companies

Stan spent his younger days raising hell in high school. Even he admits that he must have given his parents a rough time. To harness a little of this excess energy, his father put him to work at the age of 13 doing odd jobs around the project. This kept him busy in the summer, but high school didn't keep him busy enough in the winter. Dad put an end to the holiday by shipping him off to Kemper Military School in Booneville, Mo. He took the cure and graduated in 1947.

Shortly afterward, he got married. Then for several years, he worked with other construction companies. He worked as a laborer and as an iron worker, proving to himself that he didn't have to be the boss's son to get a job. He also wanted to find out how other companies operated.

At the ripe old age of 20, however, he went back to work for E. E. Barber Construction Co. Under the guidance of his father, he learned all the phases of bridge construction. He

(*Continued on next page*)

START ENGINES EVERY DAY WITH SPRAY...

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Get more starts, quicker starts, at lower cost with SPRAY STARTING FLUID. Both the fluid and propellent burn . . . there's no waste! Each pressurized can contains enough fluid for many starts . . . starts that will sustain combustion until a smooth running engine can take over. Our greater supply of "vapor pressure" at all temperatures, atomized at a high initial rate, shortens cranking and warm up time, reduces dilution, prevents electrical and starting system wear, saves wasted man hours and equipment down-time. SPRAY is atomized for safe application and quantity control . . . use only as much as the engine requires. Field-proven SPRAY STARTING FLUID will start the toughest engine down to 65° below zero . . . but for year 'round economy start engines every day with SPRAY! Sold through automotive jobbers everywhere.

Ask about INSTNSTART closed system starting.

Insist on the can with the "balky donkey" trademark.

SPRAY PRODUCTS CORPORATION

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"HYDROWAY®" world's most practical all purpose dynamometer and it's hydraulic

Model pictured shows Pre-Set Pointer, Used for Setting—Not to Exceed Loads, etc.

"HYDROWAY" Hydraulic Dynamometers are for practically all kinds of heavy duty weight and tension measurement for cable anchoring devices; equalizing guy-wire tension; measuring suspension bridge strain and for use as traction dynamometers. HUNDREDS OF USES: Such as Torque testing, Tensile testing, Traction testing. Can be used as a hanging scale for weighing, check weighing and inventory material weighing.

"HYDROWAY" Dynamometers are accurate; portable; compact, ruggedly built; maintenance free.

• CAPACITIES 0-5000 pounds to 0-10,000 pounds • Dial diameter—6" • Weather proof • No oiling or fluid required • Permanently sealed • Economically priced

Guarantee: All "Hydroway®" Dynamometers are guaranteed to be free of defects in workmanship and materials.

Made by the originators of *"HYDROSCALE®"* (world's largest manufacturers of Hydraulic Crane Scales).

HYDROWAY SCALES, INC.

STEPHENSON HIGHWAY • ROYAL OAK, MICH.

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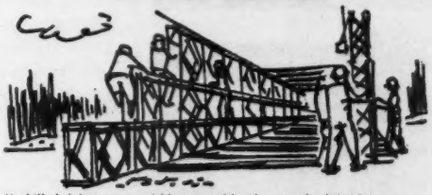
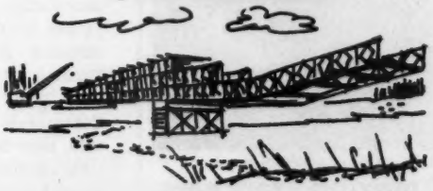
WHEN TIME COUNTS Look To BAILEY BRIDGING

FOR FAST ERECTION



Unskilled labor can quickly assemble the standard bridging components. Bailey Bridging is the ideal answer for emergency or rush schedules to provide temporary or permanent bridging.

QUICK LAUNCHING



EASY PLANKING

Using a simple cantilever system, the bridge is quickly moved across the river. Can be decked with timber supplied locally or with special steel decking.

AND CLOSING THE GAP!

In record time—a bridge like this appears and immediately begins to carry traffic across former barrier. Such an economical method of spanning rivers, valleys and gorges is a major factor in opening remote territory for the tourist, mining and lumbering industries.

Every Part Fully Guaranteed

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38 Commercial Road Tele. HU 5-4424 Toronto 17, Canada

U. S. REPRESENTATIVES

Timberland Machines Inc. 169 Front Street South Portland, Maine

Mason and Bonan Inc. McClure Building Frankfort, Kentucky

Bailey Bridge Equipment Co. 1767 Conejo Avenue San Luis Obispo, California

For more facts, circle No. 419

(Continued from preceding page)

learned how to drive cofferdams, build forms, place concrete, set steel. He learned how to do the work, and the cost of doing it.

When he was 21, he was made superintendent—the position that he holds today. His wife, Cumilla, whom he married when they were 17, has not exactly been sitting still all these years. She has provided Stan with a good crew of future bridge builders: three boys, Stanley, 11; Steven, 9; Scott, 4; and one baby girl, Sharron Ann. Stan's older brother superintends the company's projects in Arkansas. His younger brother is studying pharmacy. He also has two sisters.

Most of what Stan knows about bridge building, he learned from his father. As Stan says, "He was a good teacher, but a tough teacher. The things he chewed me out the most for, I remember the best.

"I recall one time I was hanging on the edge of a form, trying to nail on some hardware. Dad, standing below, told me to get the job done. I couldn't reach where I wanted to pound, so I yelled at dad:

"I can't do it."

"Look, son," he yelled back, "There's only two can'ts on this job. If you *can't* do it, you *can't* stay."

Speaking of his father, Stan says, "He's spent most of a lifetime building this business. He built it slowly and honestly. His word is as good as anything written on paper. I only hope I'm able to live up to the reputation he's made for the company."

E. E. Barber, president and founder of the company, still takes an active part in the business. He's often out on the job keeping his eye on the construction.

Much of Stan's success as a superintendent stems from his ability to handle men. He expects more from his men than other supers, and he gives them more in return. He likes to train his men, to help the good ones to take on more responsibility. He tries to make every man feel the pride in the work that he does. As Stan put it, "I don't want any man working for me that isn't glad to be doing just what he's doing."

Has new ideas

Stan's ingenuity and imagination have often led to new methods of construction. On one bridge job, he figured out a time-saving way to prefabricate pier forms. (See "New Forming Method, Cap-Form Support Cuts Work Time on Bridge Piers," CONTRACTORS AND ENGINEERS, May, 1959, page 84.)

On another job he was faced with the problem of cutting off the side of a bridge that was to be widened. Cutting the deck with pavement breakers was a long, slow process. He had an idea that Primacord, laid along the line of the cut on top of the concrete, would get the job done. He twisted several strands together, packed a little mud over them, and set it off. It did the job.

Like most superintendents, Stan's seldom in the construction shack. He's out, hopping around on the job, keeping the men and machines busy. In keeping up with the work, he wears out about a leg a year.

In his last bout with the hospital Stan was pulled off a bridge job. After a few months, when he was released, the doctors told him to find an office job and stay off his leg.

He listened patiently; then he picked up his crutches—for at that time he couldn't wear his leg—and went out to boss his biggest job—the $1.4 million double bridges crossing the North Canadian River in Oklahoma City.

"I'm a lucky guy," says Stan. "I'm doing the kind of work I love. And I'll keep doing it, even if I have to be pushed around the job in a wheelchair." THE END

Curtiss-Wright division appoints sales manager

■ Clyde C. Williams has been appointed general sales manager for the Utica Division, Curtiss-Wright Corp., at Utica, Mich. He was formerly associated with the Marine and Industrial Division, Chrysler Corp.

NOW...You Can SLASH Trench Costs

Model M-3, 9 HP, Illustrated

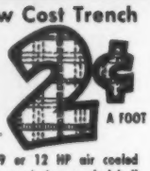
Amazing Trenchers

MODELS: C-3, 7 HP • M-3, 9 or 12 HP

DITCH WITCH

Produces Low Cost Trench

. . . overall cost less than any other machine or method! Usually about . . .



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NOW IT'S BUILT: 7, 9 or 12 HP air cooled engine, 3-speed transmission, sealed ball bearings, 20M lb. test steel digging chain, replaceable teeth Stellite edged, telescoping tubular steel boom, screw jack depth control —rugged throughout!

WHAT IT WILL DO: Trench at speeds up to 12 FPM, widths 3" to 12", depths 2' to 5', digs in any soil. Countless applications for utility service lines, gathering systems, signal systems, cathodic protection, street lighting, sprinkler systems, road crossings, etc.

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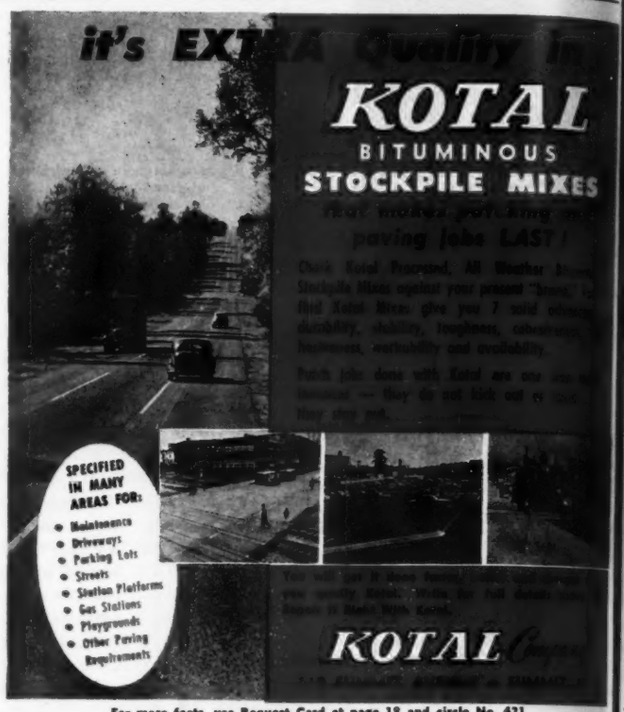
For more facts, use coupon or circle No. 420



For more facts, use Request Card at page 18 and circle No. 421

TRACTOR STANDS

The safe, convenient, time-saving method of supporting your tractor for repairs and maintenance. Tractor stands are designed to fit the draw bar, transmission case, springs or front end of all track-type tractors, and at less cost than you can build them in your shop. Order today a set of these safe, convenient tractor stands and save valuable time performing your maintenance.

One Required Per Tractor

Two Required Per Tractor

Easy pull-a-pin adjustable height from 30" to 42" with 4" graduations. Length 36", shipping weight, 135 lbs. each, f.o.b. factory $42.50 ORDER DIRECT

Adjustable height from 21" to 25" with 4" x 4" oak block extension chained to stand. Shipping weight, 150 lbs. per pair (2) f.o.b. factory $39.50 ORDER DIRECT

Tractor stands are all welded, sturdily constructed of heavy-duty seamless steel tubing and channel iron. Load capacity is capable of supporting the weight of the heaviest tractors, plus maximum safety factor. 1" x 4" solid oak plank securely bolted to top of each stand eliminates metal to metal slippage.

TRACK JACKS

Place your tractor on stands safely in a matter of minutes with this ideal companion accessory, the Swick-Guth Track Jacks. Shipping weight, 300 lbs. per pair, f.o.b. factory $79.50 ORDER DIRECT

SWICK-GUTH — Rebuilders of broken or cracked diesel heads, blocks and transmission cases for over 25 years. Write for catalog.

SWICK-GUTH CO.
BOX 498, McPHERSON, KANSAS
SPECIALISTS IN WELDING

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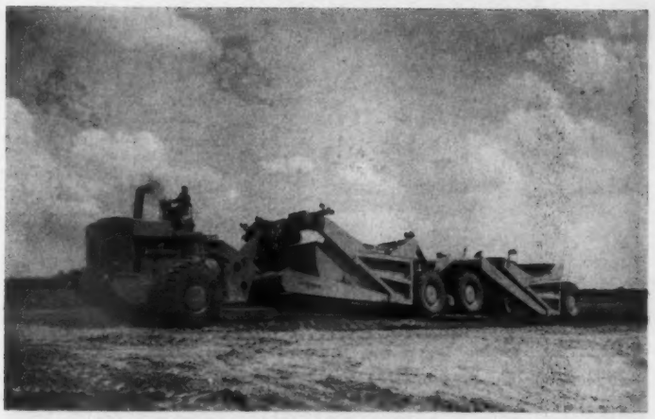
A Euclid loader, pulled and pushed by Caterpillar D8 tractors, charges a Euclid bottom dump, as an empty Euclid follows. Two such loaders are on the project, which involves excavation of over 10,600,000 cubic yards of material, to grade the three runways for the new Dulles International Airport at Chantilly, Va.



One of the first R. G. LeTourneau 100-ton double scrapers gets its bumps on the huge earthmoving job. This machine, which is self-loading in about 2½ minutes, is driven by all-electric wheels. The rear bowl is filled first, raised, and then the front bowl is lowered to be filled. Two Cummins diesels provide the electric power for rig.

Big job, plus tight schedule, demands

Mammoth fleet to move earth

Working two 10-hour shifts six days a week, together with a tremendous equipment fleet, has allowed C. J. Langenfelder & Son, Inc., Baltimore, Md., to move about 500,000 cubic yards of material per week.

Airport graded

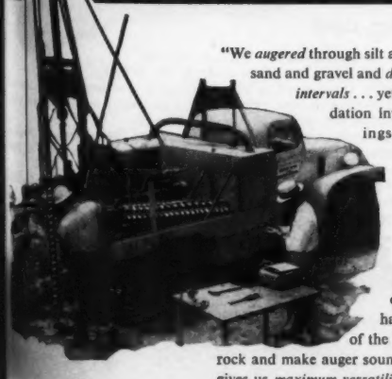
This work, under two separate contracts, is part of the grading phase for the new $100 million Dulles International Airport, located near Chantilly, Va., which will serve the Washington, D. C., area. The first contract is for the grading and drainage for the two north-south parallel runways; the second is for the grading of the third east-west runway and the paving of all three runways. Total excavation amounts to 10,600,000 cubic yards.

The terrain of the 9,400-acre site is flat to rolling and requires cuts not more than 15 to 20 feet deep. All of the excavation is being handled with conventional road-building equipment. Each of the runways will be 11,500 feet long and 200 feet wide when completed in 1961.

(Continued on next page)

"BE-36 MOBILE DRILL gives us maximum versatility and ease of operation"*

*G. D. MANN, *President*, ATEC



"We *augered* through silt and clay, *drove casing* through sand and gravel and *drove split-spoon samplers at 5' intervals* . . . yet *averaged 130' a day* on foundation investigations for steam crossings and interchanges for the Columbus Interstate By-Pass."*

According to G. D. Mann, President-owner of the American Testing and Engineering Corporation (ATEC) of Indianapolis, Indiana, "We have found that the mobility of the BE-36 and its ability to core rock and make auger soundings as well as drive casing gives us *maximum versatility and ease of operation.*"

MOBILE DRILL

Compact, self-powered, self-contained BE-36 *pays off in production and profits!* Write today for specifications and prices . . .

MOBILE DRILLING, Incorporated
960 N. Pennsylvania Street • Dept. C3 • Indianapolis 4, Indiana

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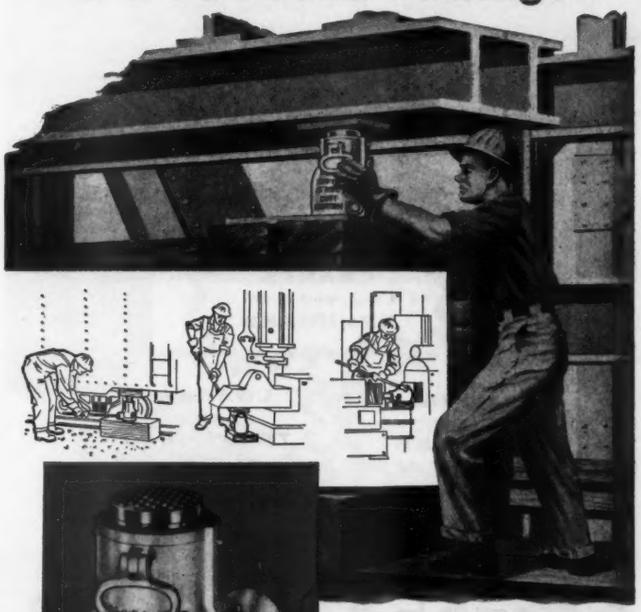
200,000 Pounds Of Lifting Power In a 98 Pound Package



The 100 ton capacity Duff-Norton Aluminum Screw Jack weighs only 98 pounds. It is easier to handle and spot than any other type of jack of the same capacity which may weigh two to five times more.

Maintenance is virtually eliminated by the rugged construction—aluminum alloy housing and base—heat-treated steel lifting screw—sealed-in lifetime lubrication. This enables these jacks to withstand hard usage in any weather without damage.

The design of these jacks makes it impossible for them to creep—will support load indefinitely. They can be used in any position—have no fluid to leak—no air to lock. Duff-Norton Screw Jacks are ideal for heavy riggers or for construction and maintenance crews in shipyards, steel mills and other industries.

Duff-Norton Screw Jacks are available in 25, 35, 50 and 100 ton capacities in aluminum—in 15, 25, 35 and 50 ton capacities in malleable iron. For full details on these durable, all-purpose lifting jacks ask your distributor or write for Bulletin AD-12s.

DUFF-NORTON COMPANY
P. O. Box 1889 • Pittsburgh 30, Pennsylvania

COFFING HOIST DIVISION • Danville, Illinois

DUFF-NORTON JACKS
Ratchet • Screw
Hydraulic • Worm Gear

DUFF-NORTON

COFFING HOISTS
Ratchet Lever • Air
Hand Chain • Electric

For more facts, use Request Card at page 18 and circle No. 424

Two Allis-Chalmers HD-21 tractors pair up on this Euclid loader to provide the motive power. Material is being removed by the loader in about 3-foot layers and charged into Euclid bottom dumps. Contractor is working two 10-hour shifts per day, six days a week to meet the tight construction schedule of the project.

Two Ingersoll-Rand drills, mounted on a Caterpillar D8 tractor, sink blast holes for pipe trench. Drills are powered by an Ingersoll-Rand 600-cfm compressor mounted on rear platform of the tractor. Most of the rock excavation is being done for the drainage system required for the three runways. Rock is mostly shale.

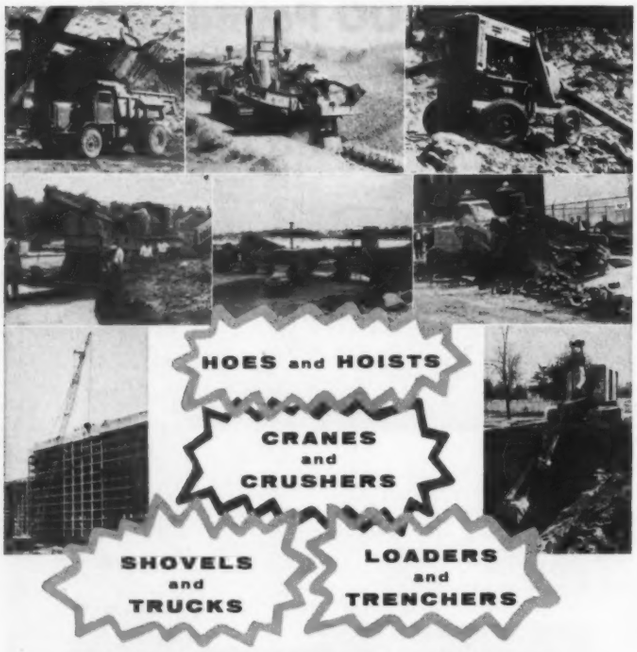
(Continued from preceding page)

Equipment fleet

Langenfelder has the following equipment fleet on the job:

28 Euclid bottom-dumps
6 Euclid rear-dumps
2 Euclid loaders
6 Euclid TS-24 scrapers
6 Caterpillar DW20 scrapers
2 Caterpillar 977 Traxcavators
1 R. G. LeTourneau 100-ton scraper
11 Caterpillar D9 tractors
26 Caterpillar D8 tractors
1 Caterpillar D7 tractor
3 Allis-Chalmers HD-21 tractors
2 Euclid TC-12 tractors
1 Michigan 480 tractor
8 Caterpillar No. 12 graders
3 Buffalo-Springfield Kompactors
8 50-ton pneumatic rollers
15 sheepsfoot rollers
6 tractor-drawn scrapers
9 cranes and shovels, ¾ to 3½-yd. capacity
2 Gardner-Denver Air Tracs

THE END



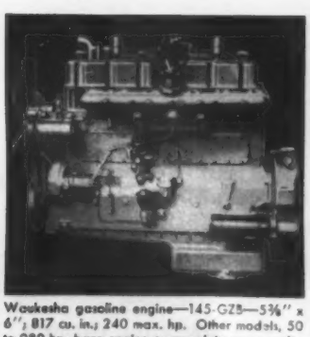
CONSTRUCTION MACHINERY OF ALL KINDS

WAUKESHA

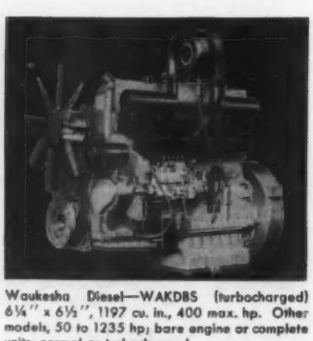
powers 'em all

50—1235 hp DIESEL, GASOLINE, LPG

Specially adapted to general contractors' needs, Waukeshas handle every load demand easily and eagerly, and with power to spare. All Waukeshas are easy to start and operate; they will turn out more work, steadily and speedily. Economical to fuel and maintain. 50 to 1235 hp. Get the complete Waukesha performance story from your Waukesha distributor.



Waukesha gasoline engine—145-GZB—5⅜" x 6"; 817 cu. in.; 240 max. hp. Other models, 50 to 980 hp; bare engine or complete power units.



Waukesha Diesel—WAKDBS (turbocharged) 6¼" x 6½", 1197 cu. in., 400 max. hp. Other models, 50 to 1235 hp; bare engine or complete units; normal or turbocharged.

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN

NEW YORK TULSA LOS ANGELES

Factories—Waukesha, Wisconsin, and Clinton, Iowa 452

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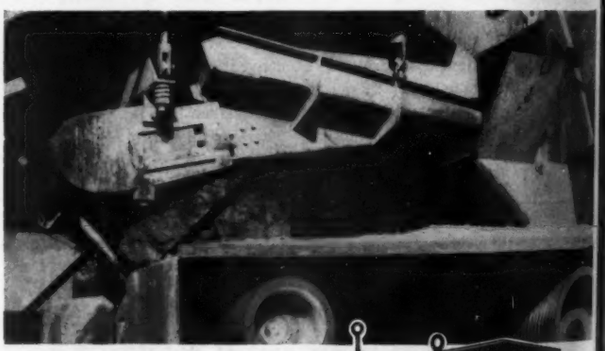
SYNTRON Vibra-Flow

VIBRATORY FEEDERS



Feeding stone from scalper to secondary crusher

Reduce bulk materials handling cost

SYNTRON Vibratory Feeders are designed for efficient, dependable, high capacity handling of sand, gravel, limestone or run of quarry rock.

SYNTRON Feeders are durable, constructed to withstand heavy load impact and excessive wear by abrasion. Powered by an electromagnetic principle that eliminates motors, gears, bearings and belts and assures dependable operation with low maintenance.

SYNTRON Feeders supply a smooth, uniform flow of materials to belt conveyors, crushers, screens, ball mills, and other process equipment. Rate of feed is instantly adjustable to meet production demands.

SYNTRON offers a wide range of Feeder Sizes and models with capacities from 1 to 200 tons per hour. All with variable control of feed rate.

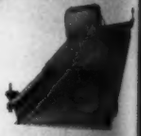
Let SYNTRON cut your materials handling cost and increase production.

SYNTRON COMPANY
227 Lexington Ave. Homer City, Pa.

Other SYNTRON Equipment of proven dependable Quality

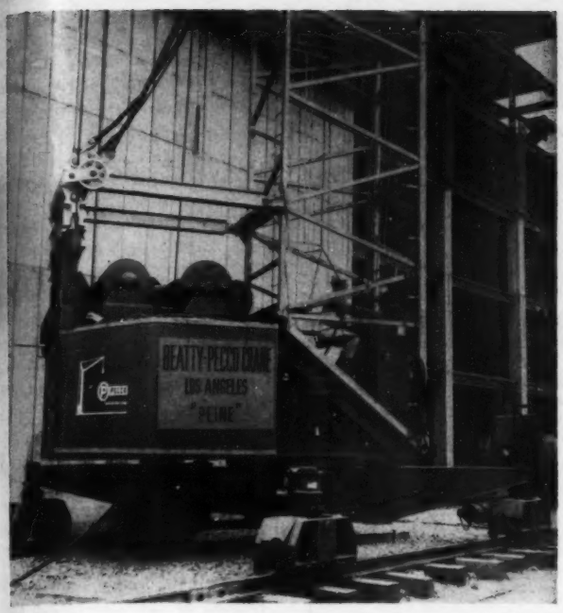
BIN VIBRATORS

ELECTRIC SAWS



VIBRATING SCREENS

For more facts, use Request Card at page 18 and circle No. 426



The operator drives the Beatty-Pecco crane from one of three cabins built into the tower. The rig, which rides on 100-pound rails supplied by the Los Angeles office of L. B. Foster Co., travels at speeds up to 154 fpm.

Tower crane handles variety of jobs on building

Two conventional cranes and a materials tower have been eliminated on a West Coast building by a tower crane, recently introduced by Beatty Scaffold of Southern California, Inc.

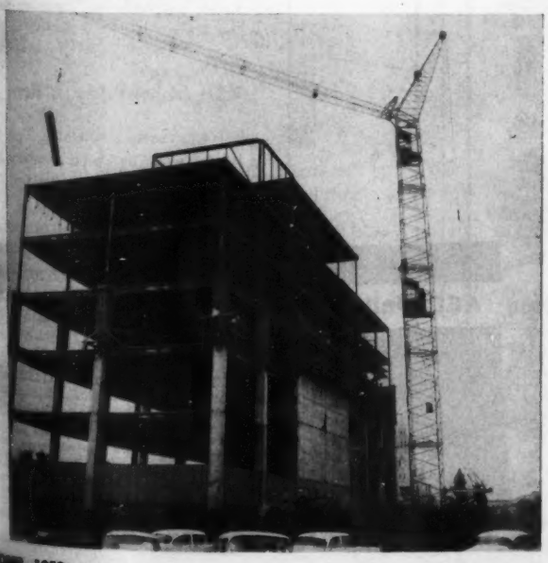
From the start of construction on the new home office of Pacific Fidelity Life Insurance Co., Los Angeles, the crane has been a jack-of-all-trades. It erected all the steel on the 6-story structure and, according to the contractor, McNeil Construction Co., it cut 15 days off estimated erection time. Riding a track alongside the building, the rig could reach the entire erection area with its 93-foot adjustable jib pivoting from the top of its 100-foot-high tower.

The Beatty-Pecco crane has been efficient at handling other types of hoisting. It moves forms, places concrete, and performs a variety of other lifting jobs. Concrete buckets are quickly spoted where needed; buggies are not required. The crane travels at speeds up to 154 fpm on conventional 100-pound steel rail and track accessories supplied by the Los Angeles office of L. B. Foster Co.

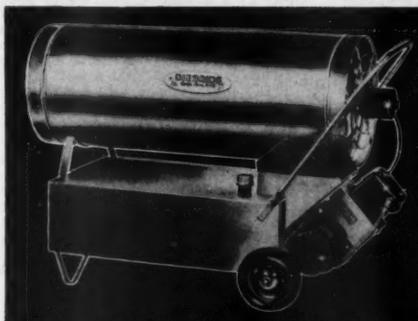
Featuring all-electric drive, the crane can be operated from any one of three cabins built into the tower. It can lift from 2 to 9 tons at speeds up to 230 fpm, and can raise or lower its boom from 15 to 75 degrees in 40 seconds.

The crane will automatically cease to operate when the load on the hook is too great, if the hook is wound too high or the jib is luffed too high or too low, or when the crane approaches the end of the track on which it rides.

The slewing crane reaches over the 6-story frame of a new insurance building in Los Angeles to pick up some timbers. The rig can reach the entire erection area with its 93-foot adjustable jib pivoting from the top of its 100-foot-high tower.



LOW COST ON-THE-JOB HEAT



Siebring WEATHER MASTER PORTABLE SPACE HEATER

All night burning with 18 hour capacity fuel tank.

Powerful fan blows 500 cubic feet warm air per minute.

Cool exterior prevents painful burns.

Completely automatic ignition.

ELECTRIC-OIL OPERATED

200,000 BTU's $295.00
300,000 BTU's $350.00
(f. o. b. George, Iowa)

959 Grace Avenue

1/20 HP, 110 volt, 60 cycle, AC motor for constant fan power.
1/6 HP, 110, 60 cycle, AC motor for complete burning with atomizing burner and electrode.

SPECIALTY SALESMEN WANTED!

WRITE OR CALL
Siebring MANUFACTURING CO.
GEORGE IOWA

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HEAVY DUTY BEAUTY

Model CP-369 Concrete Saw

Another Concut "First" . . . Center Blade Mounting for perfect balance and increased efficiency. A 36 HP Unit that saws fast, straight and deep. Full Hydraulic Controls with Forward and Reverse Propelling and Power Raise Out makes the CP-369 the easiest handling heavy duty unit available. "Up-Cut" action and Blade Saver Switch increase unit efficiency and Blade Life.

BALANCED DESIGN
FULL HYDRAULIC CONTROLS
FORWARD & REVERSE DRIVE, POSITIVE BRAKING

Write or contact your Concut representative for details.

CONCUT CONCRETE & ASPHALT SAWING EQUIPMENT

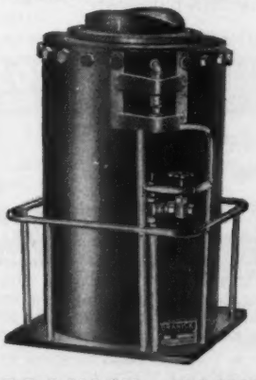
distributed in the Mid-west by . . .
CONCUT MID-AMERICA Inc., 5783 N. Lincoln Ave., Chicago 45, Ill.

1845 Belcroft Ave., El Monte, Calif.

For more facts, use Request Card at page 18 and circle No. 428

LIFTS 9 TONS

IN SECONDS — POWERED BY 160 LBS. OF AIR LINE PRESSURE



Branick AIR-OPERATED EARTHMOVER JACK

The EARTHMOVER JACK lifts Earthmovers and Extra Heavy Equipment, quickly and handily for tire and repair service. Jack can raise (from 25") to full height of 44" in 20 seconds. Each additional 20 lbs. of air pressure will raise 1 ton. Equipped with valve stem for earthmover tire chuck and small stem adapter. Screw type needle valve gives complete control for holding and releasing air. Shipped assembled, ready to operate.

WRITE TODAY FOR COMPLETE DETAILS

BRANICK MANUFACTURING CO., INC.
2600 Third Avenue — Fargo, North Dakota

For more facts, use Request Card at page 18 and circle No. 429

Distributor Doings

Shepherd Machinery awards engineering scholarship

Richard J. Poppler of Compton, Calif., has been awarded the 1959 Shepherd Civil Engineering Scholarship by the Shepherd Machinery Co., East Los Angeles. Poppler will attend the University of Southern California.

The 4-year full tuitional scholarship was established by the Caterpillar, John Deere dealer to benefit the construction industry in Southern California. Its purpose is to provide trained civil engineers who can keep pace with the demands of local heavy-construction activities.

Applications for the 1960 scholarship award will be accepted through February 4, 1960. Detailed information may be obtained from the Personnel Manager, Shepherd Machinery Co., 3400 S. San Gabriel River Parkway, P. O. Box 6789, East Los Angeles 22, Calif.

W. W. Shepherd, general manager of Shepherd Machinery Co., congratulates Richard J. Poppler on winning the 1959 Shepherd Civil Engineering Scholarship. He will attend the University of Southern California.

Mr. Construction Manufacturer

At the A.E.D. convention in Chicago in January?

You should. He's one of the thousands of important equipment dealers who will attend. The *A.E.D. Convention Daily* published by CONTRACTORS AND ENGINEERS presents the opportunity for the large and small manufacturers to contact every distributor attending. At the breakfast table, in competitors' suites, literally as he gets out of bed in the morning. Approaching the fourth year of publication, the Daily is read for up-to-the-minute information and reports on each day's events. Your advertising helps assure more visits from distributors at your condex booth or suite. And isn't that why you are going to Chicago?

See him.
Advertise in the AED Daily

B-L-H division adds four distributors

Four new dealers have been appointed by the Construction Equipment Division, Baldwin-Lima-Hamilton Corp., Lima, Ohio. Jess McNeel Corp., 2215 N. W. Loop 13, San Antonio, Texas, will cover 13 counties in that state. The dealer also maintains a branch at Corpus Christi.

Reynolds Machinery Co., 4530 S. 24th St., Omaha, will serve 17 Iowa and 8 Nebraska counties; Werckle Construction Equipment Co., 13155 S. Francisco, Blue Island, Ill., handles 10 counties in that state and three in Indiana. Federal Equipment (Eastern) Ltd., 895 Montee de Liesse, St. Laurent, Montreal, Que., Canada, covers the Province of Quebec. This dealer also has a branch in Quebec City.

All four dealers will distribute Lima shovels, cranes, draglines, and pull-shovels, and the Lima Roadpacker.

Yale & Towne division names representative

Southern Industrial Equipment Co., 7200 N. W. 29th Court, Miami, Fla., has been named a franchised representative for the sales and service of industrial lift trucks and tractor shovels produced by the Yale Materials Handling Division, The Yale & Towne Mfg. Co., Philadelphia. The dealer will cover the southern part of the state.

RCA names Texas firm

Electronic Associates, Inc., Midland, Texas, has been named a manufacturer's representative for Radio Corp. of America, Camden, N. J. The dealer, which operates primarily in the west-central part of the state, will handle sales of such RCA mobile units as the Carfone, the Personafone, and the Radio-Phone to a wide variety of companies.

SALES REPRESENTATIVE

Leading manufacturer of asphalt plants has opening for hard-hitting sales representative. Prefer salesman with prior asphalt plant experience. Dealer organization long established. Salary, traveling expenses and bonus arrangement. Good opportunity with one of oldest manufacturers. Reply Box 518, CONTRACTORS & ENGINEERS, 470 Fourth Ave., New York 16, N. Y.

Cockshutt expands

Cockshutt Farm Equipment Ltd., Brantford, Ont., Canada, plans to enter the construction and material-handling field.

Parsons adds dealer

Feenaughty Machinery Co., 112 S. E. Belmont St., Portland, Ore., has been appointed a distributor for all trenchers produced by the Parsons Co., division of Koehring Co., Newton, Iowa. The area assigned to the dealer is the state of Oregon, with the exception of Malheur County, and five southern Washington counties.

I-H adds distributor

Wright-Thomas Equipment Co., 1338 MacCorkle Ave. S. E., Charleston, W. Va., has been appointed a crane-excavator distributor by Bucyrus-Erie Co., South Milwaukee, Wis. The dealer will cover all but four counties in the state.

Parker-Hannifin assigns

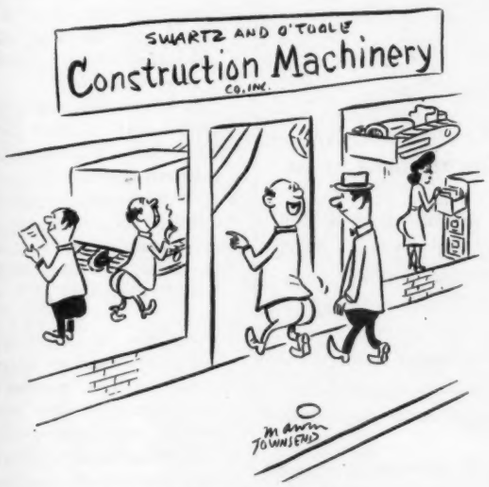
Wallace Tube Division, 1300 Diversey Parkway, Chicago, has been named a franchised distributor for hydraulic accumulators produced by the Parker Hydraulics Division, Parker-Hannifin Corp., Cleveland.

Pacific Mercury names

Allegheny Machinery & Sales Co., Inc., 600 Greentree St., Pittsburgh, has been appointed a stocking distributor for Pacific Mercury Mfg. Corp., Van Nuys, Calif. The dealer will carry electric plants and Solo concrete vibrators.

Worthington appoints

Baker Equipment Engineering Co., Inc., 404 Morris St., Charleston, W. Va., has been named to handle the distribution of construction machinery for Worthington Corp., Harrison, N. J. The dealer will cover all but four counties in the state.



"Step inside sir, and I'll show you a collection of the biggest buckets you've ever seen under one roof."

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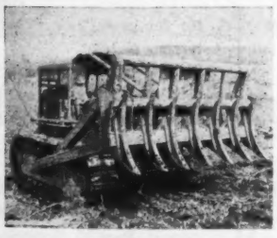
ROCKLAND— THE MOST VERSATILE LAND-CLEARING ATTACHMENTS IN THE WORLD.



REVERSIBLE TEETH:
BOTH ENDS MAY BE USED FOR CLEARING

- ROCK RAKES
- GENERAL PURPOSE RAKES
- BRUSH RAKES
- TREE KNOCK-DOWN BOOMS
- TREE SAWS
- BACK-RIPPER TEETH
- STUMPMASTER BLOCKS
- STUMP PULLERS
- TOOL BARS
- UNDERCUTTERS
- ROOT CUTTER TEETH
- HI-BALLS AND CHAIN

Rockland Products may be purchased from Allis-Chalmers, Eimco, International Harvester and Oliver Crawler Tractor dealers. For additional information, contact direct.

ROCKLAND ALLIED EQUIPMENT CO.
3778 West Colonial Drive • Orlando, Florida

For more facts, use Request Card at page 18 and circle No. 431

FOR TEMPORARY HEAT
ON ALL WINTER WORK... INSIDE-OUTSIDE... USE
INSTO-HOT

SALAMANDERS
LP GAS — 4 MODELS

FEATURES
- PORTABLE
- CLEAN
- ECONOMICAL
- NO FUMES
- NO SMOKE
- NO SOOT

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LP GAS — 2 MODELS

TYPICAL USES: DRYING PAINT AND PLASTER . . . CURING CONCRETE . . . WORKER'S COMFORT . . . HEATING WAREHOUSES, SHANTIES, SHEDS AND MATERIALS.

INFRA-RED HEATERS
LP GAS — 3 MODELS

THE MOST COMPLETE LINE OF PORTABLE HEATERS WITH CAPACITIES UP TO 150,000 BTU PER HOUR, BOTH MANUAL AND AUTOMATIC OPERATION. PRICES $19.50 AND UP

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996 E. WOODBRIDGE • DETROIT 7, MICHIGAN

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Manufacturers Memos

Herbert Clark, Jr., Indiana state sales manager for Armco Drainage & Metal Products, Inc.

The new Indiana state sales manager for **Armco Drainage & Metal Products, Inc.**, Middletown, Ohio, is **Herbert Clark, Jr.** Prior to his new appointment, Clark was manager of railroad sales for the Great Lakes division of the firm, which is a subsidiary of Armco Steel Corp.

Armco Drainage has its 55th manufacturing plant under construction at Wallkill, N. Y. The $600,000 plant, located on 8½ acres, will have 31,000 square feet of floor space. Target date for completion is March, 1960.

Operations will be under the general direction of **T. M. Neibling**, vice president and manager of the company's eastern division, and **B. C. Dickey**, production supervisor.

The appointment of **Charles R. Gibbs** as director of service of the Industries Group is announced by **Allis-Chalmers Mfg. Co.**, Milwaukee. He succeeds the late Carlton B. Smith.

Thomas J. Hanley takes over Gibbs' former post as manager of the service section.

New assignments have been made in the company's recently formed Defense Products Division. **Robert R. Walker** is sales manager, with responsibility for all defense sales efforts covering all product lines and capabilities of the firm. He is assisted by **Hugh H. McDaniel.**

Marvin Buege is chief of contract administration, handling the negotiation and administration of government contracts. **Hugh B. McGreal** is project co-ordinator responsible for proposals and invitations and their co-ordination and follow-up. **A. J. Bennett** becomes administrative assistant to the sales manager.

Gordon R. Kennel is supervisor of military-vehicle sales; and **James A. Rainey**, as sales supervisor for commercial vehicles, is in charge of sales of the company's vehicular product line to the government.

The Construction Machinery Division has appointed four to newly created posts: **V. M. Holloway** is general sales manager; **A. E. Dorn**, manager of sales training; **J. M. Haile**, assistant general sales manager; and **E. A. New**, manager of dealer development. **L. D. Myers** is the new Eastern region sales manager; and **L. D. Craggs** succeeds him as branch manager at Memphis, Tenn.

Leonard A. Freeman, executive vice president of Pacific Mercury Corp.

Leonard A. Freeman has been named executive vice president of all operations for **Pacific Mercury Mfg. Corp.**, Van Nuys, Calif. He was previously vice president and general manager of the Joplin Division.

Two vice presidents have been named by **U. S. Steel Corp.**, Pittsburgh: **John Pugsley**, executive vice president of accounting, and **Wilbert A. Walker**, administrative vice president and comptroller. Pugsley, previously administrative vice president of accounting, succeeds **George W. Rooney**, who retired.

The new executive vice president and general manager of **Syntron Co.**, Homer City, Pa., is **Byron K. Hartman.** Syntron, a subsidiary of Link-Belt Co., manufactures vibratory material-handling equipment and electronic devices and equipment.

Gerald L. Sanders has been appointed product sales manager of the rolling-mill department of **Lewis-Hydropress Division**, Baldwin-Lima-Hamilton Corp., New York City. He is a specialist in the development of plants, installations, and equipment for the production of steel and non-ferrous metals.

Chief project engineer **William L. Govan** assumes the additional functions of product sales manager for hydraulic machinery.

Three executive promotions have been made by **Trailmobile, Inc.**, Cincinnati. **Paul W. Heasley**, former vice president and treasurer, has been appointed vice president of corporate affairs.

C. P. Reynolds, Jr., has been named vice president and comptroller. He will be administrative assistant to the president.

Former assistant comptroller and assistant secretary **J. O. Ruehlmann** has been promoted to treasurer.

The new manager of the Foundry Division of **American Hoist & Derrick Co.**, St. Paul, Minn., is **R. W. Wilson.** He was formerly assistant manager of the division.

WHEN YOU RUN A **REICHDRILL**
YOU'VE GOT A RIG THAT IS **ALL-HYDRAULIC**
AND FEATURES **TOP-DRIVE**

Drillers get "more hole per hour with a REICHdrill" because . . .

REICHdrill Model T-650H, heavy truck-mounted drill for rotary or down-the-hole work. Hole size to 7⅞" in hard rock. Down pressure to 30,000 lbs.

Choice of other hole sizes and down pressures available. Crawler-mounted rigs can be furnished in all models.

ALL-HYDRAULIC TOP-DRIVE MEANS:

1. **Infinitely variable speed** of drill rotation from zero rpm to maximum rated speed of model—permits the right rotational speed for every formation.

2. **Safety torque release** which practically eliminates all chance of drill breakage . . . protects all drive components.

3. **Direct-drive to drill stem** eliminating power loss . . . no complicated transmission to wear or maintain . . . no rotary table.

4. **In and out of the hole faster** because no Kelly bar is required.

5. **Operator can drill up as well as down** should bit become stuck.

And the REICHdrill offers these outstanding advantages: Dependable heavy duty CP Compressors supply plenty of air to suit demand . . . Fast-acting, ram-type hydraulic levelling jacks . . . CP "Air-Blast" Bits give you extra footage in the toughest formations . . . Angle drilling—operator simply sets correct angle and drills.

Write for full information on REICHdrills, today!

REICHdrill
Division: Chicago Pneumatic Tool Company
1439 ASH STREET, TERRE HAUTE, INDIANA

For more facts, use Request Card at page 18 and circle No. 433

WHEN THE JOB'S RUGGED and the shovel's big, you need an AUTOCAR . . . like this planetary gear drive AP-25.

The BIG loads call for Autocar . . . nothing less

This Autocar AP-25 is a brute. Watch it take the avalanche dropped from a big shovel—or come out of a hole hauling peak tonnage. You'll see *proof* that it's built for big payloads and fast trip cycles.

Reinforced box frame. Exceptional ground clearance. High maneuverability. Plenty of power at the wheels—thanks to planetary gear drive. *All* of these outstanding features account for the AP-25's remarkable performance. Unequaled cab design virtually eliminates profit-slashing driver fatigue.

No matter what the weather or how tough the going, Autocars work harder, longer because there's no compromise in building an Autocar . . . *every* component is selected to form a balanced unit which is custom engineered to *your* operation.

Why settle for less than Autocar . . . "World's Finest."

Autocar
"World's Finest"

Division of
The White Motor Company
Exton, Pa.

For more facts, use Request Card at page 18 and circle No. 434

600 hp Michigan replaces tandem-pushers on Hugh Steele Inc. highway job

Earns $126 extra per hour

"Earning their keep!?! Why, in a year, I could run them into the middle of the Chattahoochee River, and still walk away with a profit!"

Hugh Steele is talking about three rubber-tired Michigan Dozers that are making their mark in big, bold dollar signs all around his 18.1 mile highway contract near Ashburn, Georgia.

Biggest profit producer is in the cut. It's a *600 hp* Michigan Model 480! This big rig started out in demonstration against two 190-hp crawlers push-loading in tandem. The results were so one-sided Mr. Steele wouldn't let Atlanta distributor Stith Equipment Co. take the Michigan off his job.

Scales, stop watch tell the story: 14 more loads per hour

With scales and stop watches, this production story was recorded:

	Model 480	Tandem Crawlers
Material	Sandy clay (3000 lbs/yd)	Sandy clay (3000 lbs/yd)
Scraper capacity (each of 12 machines)	25 yds heaped	25 yds heaped
Average load time	30 seconds	44 seconds
Pusher cycle time	60 seconds	84 seconds
Average payload, scale weighed	60,000 lbs	48,600 lbs
Average pay yds	20.0	16.2
Scraper loads per 50-min hr.	50.0	35.7
Scraper output per 50-min hr.	1,000.0 yds	578.3 yds

In terms of cold cash, these figures mean simply that the Michigan *earns more dollars per hour*. A lot more! In 30c dirt, its *extra earnings* average *$126 per hour* over tandem pushers, according to Mr. Steele.

Faster pushing nets bigger pay loads

Watch a few push-loading cycles and you'll see why. The Model 480 has half again as much power as the two crawler-pushers *combined*. It backs up faster than crawlers, and being one machine instead of two, naturally positions faster (24 seconds faster, on the average, on this job). It pushes faster (at speeds up to 5 mph), which both reduces load time and keeps the dirt more "alive." Result: higher, tighter, bigger loads—and more of them.

Other Michigans save time on fill-compaction assignment

Just as the big Model 480 is producing profits in the cut, so too are two other Michigan Dozers saving money for Owner Steele on the fill. These units are both 262 hp Model 280's. They are spreading fill and compacting . . . achieving specified 95% Proctor two to three high-speed (7½ mp passes.

Speed scattered odd jobs

And that's not all. Go-anywhere mph mobility allows the Michigans sneak away from main assignments tackle emergency jobs. Towing d abled vehicles, for example. Back-fi ing around culverts. Building up lo spots in haul roads.

These are just a few of the odd jo *But the real advantage of Michigan D ers*, Mr. Steel says, *is their abilit outperform crawlers on many produc jobs too*. And do it day after day, w dependability equal to that of Mic gan Tractor Shovels. There are fo size Dozers to choose from: 162, 2 375, and 600 hp. Your Michig Distributor will be glad to show y one in action so you can judge advantages for yourself.

Michigan is the registered trademark of

CLARK EQUIPMENT COMPANY

Construction Machinery Division

CLARK EQUIPMENT

2407 Pipestone Road
Benton Harbor 16, Mi

In Canada:
Canadian Clark, Ltd.
St. Thomas, Ontario

For more facts, use Request Card at page 18 and circle No. 435